BASE DESIGN STANDARDS

FAIRCHILD AIR FORCE BASE, WASHINGTON

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INTRODUCTION

This document shall be used as supplemental directives to provide detailed information to Architect-Engineer (A-E) firms and other designers performing design services for Fairchild AFB (FAFB), either through direct contract or via the U. S. Army Corps of Engineers. It is not intended to replace Air Force Instructions (AFIs), Military Handbooks (MIL-HDBKs), Engineering Technical Letters (ETLs), Construction Technical Letters (CTLs), Civil Engineering Technical Support Office (CETSO) letters, Air Mobility Command (AMC) Commander' s Guides, and other design directives established by the Air Force.

The information herein is provided as general guidance for designers. Specific projects may require deviations from these standards, but such deviations will require approval.

DIVISION 0

SECTION 00001 - SPECIFICATIONS, DRAWINGS AND DRAFTING REQUIREMENTS

A. SPECIFICATIONS

1. Specifications shall be produced on a computer system. Designer shall submit two copies of all disks for the 100% design submittal. All disks shall be format-compatible with Microsoft® Word 97 SR-2 software. Designer shall submit allfiles on electromagnetic media, either CD-ROM (650MB), "zip" disk (100MB) or 3.5" high density(1.MB)diskettes. All specifications shall follow the MASTERSPEC Format and organized according to Masterformat, published by the Construction Specifications Institute (CSI).

B. DRAWINGS

1. Computer Aided Design and Drafting (CADD) shall be used to produce all drawings. Designer shall submit two copies of all computer drawings, prototype drawings, blocks, details, linetypes, fonts, shape file libraries, LISP routines and custom menus used in the design in accordance with federal copyright laws. Designer shall submit all files on electromagnetic media, either on CD-ROM (650MB), "zip" disk (100MB) or 3.5" high density (1.44MB) diskettes. Drawings shall conform to the guidelines defined by The American Institute of Architects (AIA) industry standard document, "CAD Layer Guidelines", Copyright 1990 and further defined herein.

2. Designer shall obtain from 92d Civil Engineer Squadron, Contract Development (CECC) Drafting NCOIC, the file of standard practices common to FAFB.

3. Drawing Number

    a. All design project drawing title blocks shall include a "Drawing Number" issued by the FAFB Drafting NCOIC. This applies to all projects solicited through the FAFB Contracting Office. This four-digit number identifies the entire set of project drawings and facilitates the base drawing filing system.

4. Document Instruction File

    a. All design packages shall include a "READ ME FIRST" file which shall illustrate how documents or files are structured in the database.

5. Drawing Responsibility

a. A "drawing" in context with AutoCAD Release 14, means a background or overlay (i.e., a layer). This drawing may be included with other referenced drawings to provide a complete plotted drawing.

b. The responsibility for developing and maintaining each drawing must be determined at the outset of each project. This responsibility must not be changed during the course of the project.

c. The designer responsible for developing each drawing must provide electronic copies to other designers when the former's working drawings are referenced by the latter.

d. Exchange shall take place when the recipient is ready to commence serious development of referenced drawings, prior to final coordination, and whenever major modifications occur.

e. At other times for coordination purposes only, prints of plotted drawings are to be furnished instead. These must be clearly marked to show the occurrence of minor revisions.

f. Background drawings which require coordination on a regular basis are as follows:

i. Background architectural floor plans.
ii. Reflected ceiling plan grid.
iii. Lighting fixture layouts.
iv. Diffuser and grille layouts.

6. AutoCAD Layer for BIXDXF/DXFBIF Translation: Selected Short Format Layer Names from CAD LAYER GUIDELINES, Recommended Designations for Architecture, Engineering, and Facility Management Computer-Aided Design, The American Institute of Architects Press, 1990.

Project Sheet

ASH	Sheet border
ASHTT	Project title block
APFNP	Non-plotting - often includes an outline frame for reference

Architectural Shared Backgrounds

AWA	Walls
AWAID	# Wall identification- fire walls and smoke partitions
AWAPR	Partial height walls
AWAPA	Wall poche
ADO	Doors
ADOID	Door identification
AGL	Windows and borrowed tiles
AGLID	Window identification

AFL	Floor
AFLLE	Floor levels and ramps
AFLST	Stairs
AFLHR	Hand and guardrails
AFLEV	Elevators, escalators and dumb waiters
AFLRP	Toilet compartments
AFLSP	Specialties
AFLWD	Woodwork
AFLCA	Casework
AFLAP	Appliances
AFLOV	Overhead bulkheads, rooflines, etc.
AFLID	Room names and numbers
AFLPA	Flooring patterns
AFLDI	Dimensions AEQ Equipment
AEQID	Equipment identification
AFU	Furniture
AFUID	Furniture identification
APFAJ	Adjacent area floor plan

Architectural

APO	Orientation plan
APOXX	Replicated linestyles
APF	Floor plan
APFDI	Floor plan dimensions
APFNO	Shared notes
APFML	Matchlines
APFKP	Keyplans
APC	Ceiling plan
APL	Large scale plan
APR	Roof plan
ACL	Ceiling grid
ADE	Details
AEL	Elevations
ASC	Schedules
ASE	Sections

Structural

SGR	Grid (column lines)
SCO	Columns
SDE	Details
SPF	Foundation plan
SPFDI	Foundation dimensions
SPS	Framing plan
SPSDI	Framing dimensions

Plumbing

PFI	Fixtures
PPPXX	Replicated linestyles
PPP	Piping plan
PPL	Large Scale plan

Mechanical

MPH	HVAC plan
MHVCD	HVAC ceiling devices
MPHXX	Replicated linestyles
MPP	HVAC piping plan
MPPXX	Replicated linestyles
MPL	Large scale plan
MDE	Details

Fire Protection

FPF	Fire protection plan
FPFXX	Replicated linestyles

Lighting

EPL	Lighting plan
ELICL	Lighting ceiling devices
EPLXX	Replicated linestyles

Power

EPP	Power plan
EPPXX	Replicated linestyles

Special Electrical Systems

EPA	Auxiliary systems plan
EAUCL	Auxiliary systems ceiling devices
EPLXX	Replicated linestyles

***XX	Replicated linestyles otherwise not possible in AutoCAD
***EX	Existing to remain
***DE	Existing to be demolished

7. Drawing Formulation

   a. The following information must accompany each exchange of AutoCAD drawings:

      i.) A list of drawings and their contents, together with uncompressed file sizes.

ii.) The plotting scale and the plotted size of each drawing.
iii.) A printed copy of the corresponding file, ACAD.LIN, for linetype information whenever a customized ACAD.LIN file is used.
iv.) A list of sizes and positions of pens on the plotter for plotting the subject drawings. This is necessary to determine line thickness.
v.) An explanatory list of all layers which do not conform to the standard AIA CAD Layer Guidelines. This includes any user definable fields permitted by the guidelines.
vi.) A descriptive list of blocks and whether they contain attribute data. Blocks which do not contain attribute data shall be exploded and purged.

b. Drawing files shall be purged of all unused blocks and layers. If frozen layers are not to be used, they must be deleted and purged. If they are to be used, they are to be turned on. Layer 0 shall be empty.

c. Drawings shall be saved in AutoCAD.DWG format. Other systems create flawed .DXF files which cannot be read.

d. If **non-standard fonts** are used, **.SHX files must be included or SIMPLEX** shall be substituted. It is not possible to display customized fonts correctly unless these files are furnished.

e. The version of AutoCAD in which the drawings are provided must be current Release in use by the base.

8. Area Management

a. In order to reduce file sizes and to accommodate plotted sheet sizes, large facility floor plans are usually divided into several areas. To facilitate assembling these areas into a single plot for small scale orientation plans, roof plans, and the like, each area shall be drawn in its relative position in coordinate space. This permits an entire floor to be correctly displayed and plotted when areas are included as externally-referenced drawings inserted at 0,0

C. DRAFTING PRINCIPLES

1. These drafting standards and conventions apply to hand drafting as well as Computer Aided Drafting, and shall be applied to both. This information shall be used as a guide to insure all projects are standardized. If any questions arise that are not covered in this section, check the Architectural Graphic Standards and the TRI-Service Standards.

2. Line weight or darkness/thickness of a line is tied to how much space separates the plane which it (the line) represents. Big space = dark lines, little space = light lines.

3. Leader lines are required for all dimensions and specific notes. They will be a fine sharp line (blue) with an arrowhead, no cross hatches or dots will be used. The arrowhead will be 1/3 the length at the back side, set AutoCAD DIMASZ (dim. Arrowhead size) to 1/8".

4. Utilities will be located on all site plans, both existing and proposed. When placing proposed utilities on a site plan they will be heavier than the existing utilities. A site survey shall be done before beginning a drawing.

5. New and existing buildings must be distinguished from each other. To do this, all new construction will be heavier than existing. A site survey shall be done before beginning a drawing.

6. Sections are cuts through an object, and are identified with the symbol on the coversheet. The arrow (or hat) points in the direction the drawing represents. The "flag" at the end of a cut line will be ½ the height of the arrow. The cut plan, the edges that would show cut marks if cut with a saw, are shown with a heavier line than the rest of the drawing. All sections will be lettered sequentially throughout the project. Be sure that the page numbers referenced are correct.

7. Elevations are views of a vertical surface. When doing an elevation of a structure all edges, such as the corner of a building will be heavier than the other details (windows for example). This includes indentations that run from the foundation to the roof. If the floor plan were placed along side, the elevation all edges on the floor plan will match the heavy lines on the elevation. The elevation symbol is the same as the section except the "hat" isn't filled in and uses numbers, not letters. Elevations will be numbered sequentially throughout the project.

8. Details are enlarged views of a plan, section, or elevation. Detail symbols will be tied into the area they show with either a circle around the blown up area or a leader pointing to it. Details will be numbered sequentially throughout the project.

9. The TRIANGLE symbol is reserved for doing change request (by Civil Engineering, Drafting personnel) and is not to be used within the body of the drawings, such as a keyed note symbol. It may be used as a symbol such as, Telephone, but must be identified in the legend.

10. Dimension lines will be thin with the dimension line unbroken and the text parallel, centered and aligned to the line. All dimensioning variables will be preset in CADD. For CADD use layer "DIM-LEADERS", color blue for all dimension lines and text.

11. Use arrowheads only for dimensions/leaders.

12. Dimensions will be placed to the right and above the object when possible. When two objects are the same, but different views, place the dimensions between the views. One dimension line will never cross another; when dimension lines are stacked one above the other, the smaller dimension will be placed closest to the object. Extension lines shall be at 90 degrees to the object when possible and approximately ½" away from the object. When the dimensions are stacked the dimension lines will be approximately 3/8" from the smaller dimension. The extension lines will begin approximately 1/16" from the object and extend 1/8" beyond the dimension line. All text will be 3/32" and when the dimension is 18" or less it will be written in inches. All the variables listed above will be preset within the AutoCAD to insure quality, standardized work throughout the section. All dimensions will

be done in a light pen (blue), this includes the text. A special layer, DIM-LEADERS, will be used.

13. Notes with leaders pointing toward a specific location will be neat, short and accurate. When more than one note for the same view is required, they will be aligned on the left edge, one above the other with a double space between notes. All leaders will be light, layer DIM-LEADERS, and notes will be heavier (green) layer TEXT.

14. The Keyed Note symbol will be an Octagon with the number centered inside. The symbol will be by the object referenced and along the note.

15. Demolition and remodeling may require specific notes attached. If so, use a symbol that may be used throughout the project.

16. PROJECT LAYOUT (index)

    a. The drawing index always starts with page one (1) being the title sheet followed by the site plan. The cover sheet will include the project location. The rest of the pages will be in sequence according to the engineering discipline.

    b. Not all the pages listed below will be used in every project, with the exception of the cover sheet. Don't overcrowd a sheet to save time, use as many sheets as required per main title before continuing to the next main title.

    c. Cover sheet: The following items will be on the cover.

        i.) Project Location: the project location or construction site will be circled and the words PROJECT LOCATION with an arrow darkened in pointing to the circle.
        ii.) Contractor storage area if different from the Project Location
        iii.) Haul Route: the haul route will be shown on the cover sheet using the symbol shown on the cover sheet (standard symbols), the thickness of the arrow may vary.
        iv.) Project Title: as assigned by programming personnel.
        v.) Project Number: assigned by programming personnel.
        vi.) Drawing Number: assigned by drafting personnel.
        vii.) Drawing Index: the cover sheet will always be page 1.
        viii.) Signatures: the project technician (draftsperson) will sign his/her name and the project engineer will get the remainder of the signatures required. Where no signature is required. N/A (not applicable) will be used.
        ix.) Date: the date will be placed on the cover sheet upon completion of 100% design.

    d. Site Plan (minimum scale of 1" = 50')

        i.) Existing site plan will show all buildings, utilities, sidewalks, parking areas, roads and graveled areas within the scope of work.
        ii.) New site plan will show the same as the existing and all new utilities, roads, sidewalks, etc. and those items abandoned or removed.
        iii.) Contour line will be shown on both new and existing site plans.
        iv.) The scale will be large enough to clearly show all the details.

v.) Building location and orientation.
vi.) Grading and drainage plan including subsurface.
vii.) Soil boring plans and logs.
viii.) Plan and profile sheets where applicable.
ix.) Details of connection into existing utilities.

e. Landscape plan and plant schedule (same scale as the site plan)

f. Architectural.

i.) Overall key floor plan with room legend.
ii.) Floor plan.
iii.) Interior color and finish schedules.
iv.) Door and window schedules including hardware schedules.
v.) Elevations.
vi.) Reflected ceiling plan.
vii.) Architectural sections and details.
viii.) Roof framing and Roof Plan.
ix.) Furniture plan and schedule, if applicable.

g. Structural.

i.) Footing and foundation plans and details.
ii.) Roof framing plans and details.

h. Mechanical.

i.) Plumbing plans, layouts and riser diagrams.
ii.) HVAC and duct work, return air, registers and roof vents.
iii.) Plumbing and HVAC details.
iv.) Show all cabinets and shelves on the floor plans.
v.) Fixture and equipment schedules.
vi.) Control diagrams, EMCS criteria, and locations.

j. Electrical.

i.) One-line diagram showing complete existing electrical service entrance from primary feeder including service transformer(s).
ii.) Primary and/or secondary taps.
iii.) Primary and/or secondary switchgear.
iv.) Service entrance.
v.) Main distribution panel.
vi.) Step-down transformers (if any) and all panels associated with the construction.
vii.) Revised one-line diagram showing complete electrical service with changes clearly identified.
viii.) New and existing material identified accordingly.
ix.) Switching and controls.
x.) Fixture schedules.

xi.) Mounting details.
xii.) Lighting equipment and schedules.
xiii.) Floor plans with power, lighting and signal plan for each floor and/or affected area .
xiv.) Show equipment schedules and identified location of equipment.
xv.) All outlets for electrical, telephone, television cable, and computer.
xvi.) Show fire alarm plans, panels, detection and pull stations.

k. If the project is a remodel or alteration there will be a demolition plan for each discipline. The demolition plan will go before the new plan.

l. Due to the size of some buildings, the floor plan may have to split to show the required detail. If the floor plan must be split and they will not fit on one sheet then they will be back to back in numbering. All floor plans will have a minimum scale of 1/8" = 1'0".

18. FINAL DRAWINGS

a. All drawings shall be prepared on a CADD system and final drawings plotted on good quality mylar (5 mil). Plotted drawings shall be standard D size (24"X36") used by the government. Drawings shall be prepared in accordance with Fairchild AFB's standards. All drawings/files shall not utilize any means of file compression.

19. AUTOCAD DRAWING FILES

a. Final drawing shall be submitted in AutoCad 14 format. Drawings produced using another software package shall be acceptable provided all drawings are converted to and 100% compatible with AutoCad 14 drawing files prior to receipt by the government. Any features peculiar to the development software used, such as shape files, menus, blocks, etc., that are not accessible using the basic AutoCad 14 package are not acceptable and must be modified to ensure the drawing files may be easily edited by government personnel.

b. All drawings shall be submitted on CD-ROM (650MB), "zip" disk (100MB), or 3.5" high density (1.44MB) diskettes. The end product shall be readable by a WINDOWS NT-compatible system.

c. Drawing files must be in plain ".DWG" file and shall not be backed up or compressed in any way.

d. A-E shall utilize Paper Space and Model Space in its drawing files. All drawings shall be drawn full size (1 to 1) in Model Space. Title sheet and border sheets shall be drawn in Paper Space. AutoCad View Ports shall be used to frame applicable Model Space drawings. Paper Space AutoCad drawings and mylar hard copies shall be identical.

e. All externally-referenced drawings (xref's) must accompany each file where it is used; do not bind xref's. All unused blocks, Dimstyles, Layers, linetypes, Shapes and Styles shall be purged from each file.

f. **All Lettering styles shall be Handletr.swx, Simplex.swx, Romant.shx or Rchtitl.shx.** 1/4" maximum plotted height for titles and 1/8" maximum plotted height for all other text. Minimum plotted height for all other text. Minimum text height to be plotted shall be 3/32".

g. Only one drawing is allowed per file.

h. Keep layers to a minimum. The layering conventions used are the American Institute of Architects (AIA), CADD Layering Guidelines. These guidelines were approved at the Tri-Service Conference held in February 1993. Remove all Frozen Layers and data not needed by that drawing file.

i. The designer will verify that a four digit drawing number is assigned to the project and that an electronic copy of Cover Sheet and Standard Title Block has been provided by the 92 Civil Engineer Squadron, Engineering Flight.

j. The final AutoCad drawings shall exhibit good drafting practice allowing for easy changes and minimal storage requirements. Drawings should make use of features to limit drawing size and complexity wherever possible.

k. File Names for Project Master Files (PMF) will be based on three factors. This file name along with the date of last revision will be placed along side the title block. This is an attribute attached to the drawing sheet drawing (DWGSHT.DWG), when the DWGSHT is first inserted you will be asked to fill in this information. For additional drawing session, use the DDATE" command to change the revision date.

l. The first factor is the drawing number which is assigned to the project by the Drafting section. This four digit number will be on all sheets, on the coversheet, and each drawing sheet in the lower right corner of the title block, where it says "Drawing Number".

m. The second factor is the engineering discipline (if required). If additional identifiers are required, use the following format.

Title/Cover Sheet = T
Civil/Site Work = C
Asbestos Abatement (environmental) = V
Architectural = A
Structural/Foundation = S
Mechanical (HVAC) = M
Plumbing = P
Electrical = E
Fire Protection = F
Landscape Architecture = L

n. The third factor is the page number within the engineering discipline. An example of this would be: the Civil site plan, first Civil sheet for a project with drawing number 2345. The drawing file name will be 2345-C1.DWG. If it is the third Electrical sheet for the same project, the file will be named 2345-E3.DWG. The cover sheet will always be named (drawing no.)-T1.DWG.

o. If the project isn't to be numbered by discipline (i.e. a water line repair project) then the file name will change slightly. The letter prefix will be dropped and all else will remain the same. For example, 2345-12.DWG.

p. To ensure the files are filed properly, all labels must be consistent. The labels shall be clear enough so that the contents are easily determined without doing a directory. The following list contains the information that is required on all labels:

   i. Four digit drawing number
   ii. Project title and number
   iii. Date
   iv. Number of disks in project (i.e. 1 of 5, 2 of 5, etc.)

COLOR	USE
CYAN	Hatching
BLUE	Hidden lines and dimensions
GREEN	Text, elevation/section and detail
RED	Text, elevation/section and detail
MAGENTA	Borders and cut lines
WHITE	Object lines, break lines

END OF SECTION

DIVISION 0

SECTION 00002 - STRUCTURAL AND CIVIL REQUIREMENTS

A. STRUCTURAL REQUIREMENTS

1. Live Loads

   a. Roof live loads shall be based on ground snow loads of 37 PSF for Fairchild AFB and 74 PSF for the Cusick Command Post distributed and applied per ASCE Standard 7-95. The ground snow loads for other areas to be determined per the Snow Load Analysis for Washington published by the Structural Engineers Association of Washington and applied per ASCE 7-95.

   b. Wind loads shall be 85 MPH basic wind velocity. Wind loads are to be applied per ASCE 7-95.

2. Seismicity

   a. Fairchild AFB is located in National Earthquake Hazard Reduction Program (NEHRP) Zone 2, on Map 2, Minor Seismicity, UBC Zone 2B. Minor tremors have been felt in the area with epicenters at distant locations. NEHRP ground velocity coefficient for Fairchild AFB is 0.05 and risk group assignment of buildings is C1. Seismic loads for designs are to be per the US Army Technical Instruction TI 809-04.

3. Equipment Rooms

   a. Provide separate access for mechanical, electrical and communication rooms.

   b. For new construction, communication equipment shall not be located in the same room as either mechanical or electrical equipment.

   c. For renovations, whenever possible the equipment shall be located in separate rooms. If separate rooms are not possible due to spatial or other limitations, the designers shall take into consideration the heat given off by mechanical or electrical equipment located in the immediate vicinity.

4. Foundations

   a. Foundations shall extend below frost depth, typically four feet below grade. Typical building foundations consist of spread footings just below frost depth and a stem wall (either cast-in-place concrete or CMU).

b. Due to the unpredictable geology in the area, borings and soil samples are recommended before foundations are designed.

B. CIVIL REQUIREMENTS

1. Soils

a. Soils consist mainly of glacial till composed of clay; low to medium plasticity, sand, medium to very fine; silt, and considerable amounts of underlying basalt. Refer to Division 16, Section 16660 - Corrosion Control in the Fairchild Base Design Standards for further information on Cathodic Protection.

2. Water Table

a. Water table varies throughout the base and throughout the seasons. It can be only 2-3 feet in some areas and up to 10 feet or more below the surface in other areas. If no boring data previously exists, borings shall be accomplished to determine depth of the water table. The variability of the water table shall be annotated in the drawings and specifications.

3. Curing Compounds

a. Except for use on airfield, no liquid curing compounds shall be allowed.

4. Base Railroad System

a. The base railroad is not maintained to support rail traffic. The rails are 85 lb standard gauge with 9 foot (2,700 mm) ties for single rails and 22 foot (6,700 mm) ties for double rails. The only remaining rail system owned by the base can be found near the Bulk Fuel Storage yard. The rail system shall be removed whenever the inclusion in the project scope allows; however, the rail system owned and maintained by Burlington Northern and Santa Fe (BNSF) Railroad circumventing the main base on the north and east perimeters shall not be removed, modified, or repaired without the consent of the Burlington Northern and Santa Fe Railroad.

END OF SECTION

SECTION 00003 - ENVIRONMENTAL

A. General

1. Policy: All designs shall comply with all applicable federal, state, local and Air Force environmental regulations to assure design enhances the natural environment, or as a minimum, has no detrimental effect upon it, while supporting the Fairchild AFB (FAFB) mission.

2. Design: All designs shall address issues identified in the following paragraphs. This section references applicable regulations and base policy relating to specific environmental issues.

3. Environmental Impact Analysis: An environmental assessment shall be prepared by the 92d Civil Engineer Squadron, Environmental Flight (92 CES/CEV) for designs at FAFB.

4. References: This section references applicable Federal, State, and local laws and regulations, as well as Air Force regulations and positions of the Base Comprehensive Plan (BCP), which relate to specific environmental issues.

   Work will be accomplished within the guidance and limitations established by, but not limited to, the following:

   a. Washington Administrative Code (WAC) 173-340, Model Toxics Control Act Cleanup Regulation**

   b. WAC 173-360, Underground Storage Tank Regulations**

   c. Washington Administrative Code (WAC) 197-11, Washington State Environmental Policy Act** and Air Force Regulation 19-2

   d. WAC 246-290, Public Water Supplies**

   e. Air Quality Requirements of WAC 173-400 through WAC 173- 491** and Title 40, Code of Federal Regulations, Part 82, Refrigerant Recycling*

   f. National Pollutant Discharge Elimination System (NPDES) Requirements, Title 40, Code of Federal Regulations, Parts 122, 123, and 124*

   g. Federal Insecticide, Fungicide and Rodenticide Act Amendments, 1972, PL 92-516*

h. Toxic Substances Control Act, 1976, PL 94-469*

i. Washington Dangerous Waste Regulations, WAC 173-303**

j. WAC 173-304, Minimum Functional STDs for Solid Waste Handling** and Spokane County Health District Regulations for Solid Waste Management and Handling (18 Aug 88)

k. Title 40, Code of Federal Regulations, Part 26-265, Hazardous Waste Management System, 1980*, and Part 761, Polyclorinated Biphenyl (PCBs), 1991*

l. Title 36, Code of Federal Regulations, Part 800, Protection of Historical and Cultural Properties, 30 Jan 79*

m. National Historical Preservation Act, Part 85-665, 1966*

n. Executive Order 11593, Protection and Enhancement of the Cultural Environment, 1971*

o. Executive Order 13101, Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition*

p. Corps of Engineers Manual, EM 385-1-1, "Safety and Health Requirements," latest edition in effect on the date of solicitation

q. FAFB Hazardous Material Emergency Response Plan (27 April 99)***

r. FAFB Hazardous Waste Management Plan (August, 2000)***

s. FAFB Stormwater Management Plan (September 1998)***

t. Spokane County Guidelines for Stormwater Management (February 1998)

u. Spokane County Air Pollution Control Authority (SCAPCA) Regulations I and II.

v. Spokane City Ordinance #30633 Pretreatment Discharge Standards

w. Emergency Planning and Community Right-to-Know Act

* Federal Regulations (CFR): Code of Federal Regulations
http://www.access.gpo.gov/nara/cfr/cfr-retrieve.html
** Washington State Regulations (WAC): Washington Administrative Code
http://www.mrsc.org/wac.htm
*** Fairchild Regulations/Plans: (must use base computer)
https://intranet.fairchild.af.mil (select “Pubs/Forms” on this screen)

B. Natural Resources

1. Wetlands: Wetlands generally include swamps, marshes and natural ponds. More than 500 acres of wetlands are located throughout the base and these areas are identified on a map and survey document maintained by 92 CES/CEV.

   Any proposed construction activities in designated wetland areas must be approved by 92 CES/CEV prior to construction. Specific activities prohibited in relation to wetlands include dredging, filling, draining and dumping of any material within the boundaries of the wetland.

2. Threatened and Endangered Species: FAFB has produced a survey concerning threatened and/or endangered species. The survey is available for review in the Environmental Flight (CEV) at FAFB.

   One federally-listed plant species has been identified on the base and it must not be disturbed by construction activities.

3. Archaeological and Historical Sites: The Base Historic Preservation Officer (92 CES/CEV) must be notified of any proposed construction involving historic buildings and structures.

   If, during construction, any artifacts or human bones are encountered, work must be stopped and 92 CES/CEV must be notified immediately.

C. Environmentally-Preferable Products

1. In an effort to promote energy savings and global use of renewable resources, the Government is endorsing the recycled-product market. It encourages the use of post-consumer "raw" materials and other recycled products as a basis for its building construction. Section 6002 of the Resource Conservation and Recovery Act (RCRA) directs the Federal Government to promote recycling. Executive Order 13101 calls for the increase in the Federal Government' s use of recycled content products. The Air Force is requiring the use of products containing recycled materials.

2. The Environmental Protection Agency (EPA) is tasked to designate products that can be made with recovered materials and they have developed a list of products that must meet minimum recycled content amounts. Using the EPA' s Recovered Material Advisory Notice (RMAN) and the Comprehensive Procurement Guideline (CPG), the Air Force is actively promoting its desire to buy recycled construction products.

3. In order to ensure quality, it is required that the contractor submits specific information regarding recycled content materials. The EPA' s recommended content levels are mandatory for AF purchases. These specific products and their content levels shall be called for and designated in the appropriate Division(s) and Section(s) of the Specification. It is mandatory that the contractor submit specific product descriptions and quantities for these materials. Included for each material shall be the following: description of item, place of origin, manufacturer, contract reference or type of submittal, unit of measurement, quantity, and value. This information shall be submitted formally on AF Form 66, Schedule of Material Submittals. Upon contract completion a summary of this information shall be

provided. In addition, if the contract covers more than one calendar year, then a report summarizing the information for the previous calendar year must submitted within 30 days of the end of year.

4. Such materials shall be evaluated, and approved or disapproved by the Government on a similar basis as a product substitution. In the opinion of the Government, if the material does not meet the intent of the specifications, it shall be the basis for disapproval. The contractor shall submit estimates of value, and certifications verifying recycled content(s) of materials utilized in the performance of this construction contract. This information is necessary to enable the Air Force to ensure that they are fulfilling their requirements to purchase items composed of recovered materials.

5. The contractor is not required to use an item containing recovered materials if, (1) the material is not available within a reasonable period of time (resulting in unreasonable delays to the project), (2) the item is not available from a sufficient number of sources to maintain a satisfactory level of competition, (3) the material does not meet specified performance standards, (4) it is only available at an unreasonable price (it is more expensive than a similar non-recycled content items), or (5) it can be shown that the item may expose employees to an undue hazard.

D. Air Quality (The Base has a Title V Air Operating Permit)

1. The Base air quality engineer (92CES/CEV) must be notified prior to any project that will alter the air emission of the Base. This includes, but is not limited to, projects involving tanks, paint booths, and blasting operations. CEV will contact SCAPCA for the appropriate permits, permit modifications, or written concurrence that air emissions will not be negatively impacted.

2. Facilities shall be designed in accordance with federal, state, and local air quality criteria.

E. Solid Waste Disposal

1. Designs shall specify the following contractor responsibilities:

   a. Contractor shall be responsible for the proper handling and disposal of all solid waste accumulated or generated on FAFB.

   b. The contractor shall make every reasonable effort to reduce the amount of solid waste generated during construction and/or demolition projects by salvaging and recycling materials to the greatest extent possible. All wastes and salvaged/recovered materials shall be tracked by the type, quantity, and disposition. This information shall be submitted monthly to the Contracting Officer within 10 days of the end of every month.

c. A plan for disposal shall be presented to the contracting officer for approval prior to the commencement of construction. Such a plan shall itemize all waste expected to be encountered during the construction or demolition process. Disposal disposition documents shall be provided to the contracting officer at project completion.

d. Inert and demolition waste shall only be disposed at facilities licensed by the county or state for such disposal (Refer to Spokane County Health District Regulations for definitions of inert and demolition wastes.)

2. The Base Recycling Center will accept corrugated cardboard (flattened) from the contractor. If available, the Recycling Center will provide a receptacle for this material upon request.

3. All Facilities shall be designed to have an outside commercial dumpster, surrounded by an architecturally compatible wall.

4. There are no disposal areas on the base. The nearest disposal location for inert waste is the landfill on Graham Road which is located just outside the FAFB back gate. All other waste shall be disposed of at the Spokane Waste to Energy Plant located approximately 12 miles (19 km) from FAFB.

F. Petroleum-Contaminated Soil

1. Designs shall specify the following:

a. All petroleum-contaminated soil encountered during excavation shall be removed and isolated from the work area. The contaminated soils shall be placed on a plastic liner with a minimum 6 mil thickness. The liner shall have sufficient strength to resist rips and tears. The liner shall be covered to prevent possible contamination of the surrounding area during or after a precipitation event. The liner and cover shall be sufficiently larger than the area of stored soil to cover the stored soil plus two (2) feet (600 mm) of excess on all sides.

b. Sampling shall be conducted to determine the degree of contamination. A representative sample of the soil shall be taken prior to soil removal. That sample shall be taken in a glass jar (minimum capacity of 8 ounces - 0.25L) with a Teflon lid liner and submitted to an approved laboratory for WTPH-HCID analysis. The action level for treating or disposing of diesel- and oil-contaminated soil is 200 mg/kg. Action level for gasoline is 100 mg/kg.

c. Soil with sample concentrations exceeding the action level shall either be heat-treated at a licensed facility or disposed at a landfill licensed for such disposal. A plan for disposal of the material must be provided to the contracting officer prior to the commencement of construction and disposal disposition documents must be provided at project completion; however, projects with extended construction or performance periods may require earlier submittals.

2. Contact Project Engineer/Manager or 92 CES/CEV for any additional guidance.

G. Hazardous Waste (as defined in WAC 173-303)

1. Designs shall specify the following contractor responsibilities:

   a. Contractor shall be responsible for the proper storage, management, and disposal of any hazardous waste accumulated or generated at the job site.

   b. Proper disposal shall include the preparation of a hazardous waste manifest LDR as required for disposal of the waste at a RCRA approved facility using the EPA Identification # for Fairchild AFB. This identification number is available through 92 CES/CEV. All manifests must be approved by 92 CES/CEV prior to movement of the waste from the base.

   c. Certificates of disposal for the treatment, storage and disposal shall be submitted to 92 CES/CEV

2. Contact Project Engineer/Manager for any additional guidance or refer to WAC 173-303, FAFB HAZMAT Plan and/or the FAFB Hazardous Waste Management Plan.

A. Asbestos-Containing Materials (ACM)

1. An AHERA (Asbestos Hazard Emergency Response Act) inspection shall be performed prior to designs for any facility scheduled for remodel or demolition. Refer to 40 CFR, Section 763 for inspection procedure.

2. All ACM removed as a result of renovation or demolition shall be disposed of in a state-approved landfill or otherwise disposed of by a federally-approved method.

3. Disposal disposition documents, copy of SCAPCA notification, and clearance sampling must be provided to BCE PM at project completion.

4. In order for the Government to be excluded from the requirement to conduct asbestos surveys on facilities in the future (per 40 CFR 763.99), any A/E responsible for the construction of a new house or building shall sign an affidavit stating that no asbestos-containing building material (ACBM) was specified as a building material in any construction document for the building, or that, to the best of his/her knowledge, no ACBM was used as a building material in the building

I. Lead-Based Paint (LBP)

1. An LBP survey shall be performed prior to designs for any facility scheduled for remodel or demolition. Conduct survey in accordance with HUD "Guidelines for Evaluation and Control of Lead-based Paint Hazards in Housing." Include representative TCLP samples for each substrate with positive lead results.

2. Refer to "Lead Exposure and Lead-based Paint Management Plan" for guidance in identification and control of hazards related to the presence of lead-based paint.

J. Stormwater Management

1. Fairchild's primarystormwater control objective is to prevent all future development of base facilities from adding to the present runoff quantity leaving the base. This means that all future development design shall provide sufficient controls to ensure there is no increase in stormwater runoff from each site. The preferred approach to excess runoff control is infiltration, which disposes of stormwater without the need for extensive conveyance and/or evaporative pond systems. This is especially critical on or near the flightline where birds, attracted to ponded water, can interfere with aircraft.

2. The amount of stormwater originating on any proposed development of land owned or leased by Fairchild AFB shall be estimated according to the rate of precipitation and percentage of runoff outlined in the Fairchild AFB Stormwater Management Plan (September 1998) and Spokane County Stormwater Management Guidelines (February 1998). Unless specifically approved by 92 CES/CEC, the rate of stormwater runoff from any proposed land development to any natural or manmade point of discharge downstream such as sewers or ditches shall not exceed the peak rate of runoff for the design storm occurring prior to the land development. Any on-site stormwater retention facilities must be designed according to the criteria outlined in the above mentioned manuals.

3. The specifications must contain a statement regarding stormwater management at construction sites. It shall outline the fact that the base is required to submit a Notice of Intent Form (NOI) for coverage under the NPDES General Stormwater Permit for any construction site greater than 5 acres in size. In order to receive coverage under this permit for the discharge of stormwater from the site, the contractor must prepare and implement a Storm Water Pollution Prevention Plan. Such plan must be developed and submitted to the contracting officer within 60 days after the Notice to Proceed. The plan shall include information about how equipment and materials will be handled and stored on the site. It shall address the containment of fuels and other hazardous materials along with applicable sediment and erosion control measures. The contractor may want to contact the local office of the Washington State Department of Ecology or Environmental Protection Agency for references outlining plan requirements.

K. Water and Wastewater Systems

1. All water and wastewater systems shall be installed in accordance with Federal, State, and local water quality criteria and standards and the following Air Force Regulations and instructions: ACCI 32-1054, MIL-HDBK 1164, AFR 91-32, AFI 48-119.

2. The Contractor shall not discharge to thestormwater or sanitary sewer systems without specific approval from 92 CES/CEV. It must be determined that any proposed discharge to the sanitary sewer system complies with all requirements contained in Spokane City Ordinance #30633 – Discharge Pretreatment Standards. Onlystormwater can be discharged into stormwater receiving conveyances such as collection lines and ditches and it must be shown that best management practices are in place to limit any discharge of pollutants such as sediment and debris.

3. All permits shall be coordinated through 92 CES/CEV.

L. Underground Storage Tanks (UST Program)

1. All underground tank installations and removals shall be coordinated through 92 CES/CEV. The Base must prepare a Notice of Intent to install a tank at least 30 days before the installation may begin. The contractor must provide data for the completion of this form.

2. All underground tank projects shall meet all of the requirements outlined in WAC 173-360.

M. Hazardous Material Tracking.

1. The contractor shall be required to maintain Material Safety Data Sheets (MSDS) for all hazardous materials in accordance with base and federal guidelines. The contractor shall submit to the Contracting Officer at the beginning of the contract, a list of all the hazardous materials he is bringing on the base for performance of the contract. The list shall include all materials to be used by the prime contractor and all subcontractors. This list will include estimated quantities of each hazardous material thatis contemplated to be used during the course of the contract. The contractor will also provide a copy of the MSDS for each product identified on the list. At the end of the contract, the contractor shall submit to the Contracting Officer a list of products and the quantity of each that the contractor is taking off the base and the quantities of each material actually used on the base during the contract. If a project covers more than one calendar year, the quantities of each hazardous material used during the previous calendar year must be submitted within 30 days of the end of the calendar year.

END OF SECTION

DIVISION 0

SECTION 00004 – ANTITERRORISM / FORCE PROTECTION

A. General

1. Design for all new construction and major renovations for inhabited structures, funded under the Military Construction (MILCON) appropriation for fiscal year 2002 and beyond, shall comply with the guidance provided in the Interim DoD Antiterrorism/Force Protection Construction Standards, 16 Dec 99, as amended with AFCESA Erata, 15 Feb 00. Designer shall confirm that this guidance has not been superceded by any subsequent DoD directives.

DIVISION 1

SECTION 01000 - GENERAL INFORMATION

A. When developing specifications for this section, refer to the Fairchild Air Force Base Design Standards sectional information developed by the 92d Civil Engineer Squadron Engineering Flight.

END OF SECTION

SECTION 01005 – SCHEDULING OF WORK

A. General Requirements

1. After the first sentence regarding the requirement fora work plan, add the following sentences:

   "This work plan shall be submitted at least twenty-one (21) calendar days before work in the area is planned to be started. The Contractor shall plan that neither Government escorts will be available nor a free zone created within this twenty-one day period."

END OF SECTION

DIVISION 1

SECTION 01010 - SUMMARY OF WORK

A. When developing specifications for this section, use the standard Fairchild Air Force Base specifications developed by the 92d Civil Engineer Squadron Engineering Flight and edit for the specific project. See attached specification for example.

B. All outages shall be coordinated with the using agency through the Contracting Officer or his representative. Written notice shall be provided by the contractor to the Contracting Officer not less than two (2) working weeks prior to the required outage. All work shall be coordinated and arranged to insure that the outage shall be of minimum duration.

C. Working hours for the contractor shall be between the hours of 7:30 am and 4:30 pm excluding Saturdays, Sundays, and Federal holidays. If the contractor desires to work during periods other than above, the contractor must notify the Contracting Officer three days in advance.

D. The normal construction season for exterior work is 15 April through 15 October. Some years are mild and construction can start 30 to 45 days earlier and/or continue 30 to 45 days later.

E. Although the mean winter temperatures are in the mid-twenties, the combination of wind (predominantly NE/SW) speed and temperature gives a mean equivalent chill temperature for January of 14 degrees F (-10 degrees C).

END OF SECTION

SECTION 01010 – SUMMARY OF WORK

PART 1- GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.02 PROJECT DESCRIPTION

A. The Project consists of, but is not limited to, [insert summary of project]

B. The Work includes, but is not limited to, [insert description of work]

C. All work is to be performed while the building remains occupied [modify if building will be vacant]. Scheduling, as described within these documents, shall be achieved to accommodate this occupation.

D. [If the work is in a housing area, specify that a "prototype" (i.e., one room/bathroom/unit) must be completely constructed prior to beginning any work on subsequent rooms or units. The purpose for requiring a prototype is to create a working model to be used: a), to establish the acceptable standard of quality in workmanship, and b), to give the Government an opportunity to review the design for potential changes needed to improve efficiencies, amenities, etc. Use basic text as follows: Contractor shall accomplish all work specified and shown on prototype unit and notify Government in writing of completion. The Government will inspect prototype for quality and conformance with the construction documents. Government will inform Contractor of any deficiencies or necessary improvements via letter. Contractor shall then have five (5) days to remedy any deficiencies listed by Government. Any additional costs and schedule adjustments needed to accomplish any improvements listed by Government will be resolved via the contract modification process. After prototype unit has been accepted in writing by the Government, work may then, and only then, commence on the remaining rooms and/or units.]

1.03 BRAND NAME REFERENCES

A. General Provisions include by reference the "Material and Workmanship" clause. This clause states "reference in the specification to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The contractor may, at its option, use any equipment, material, article, or process that, in the judgment of the Contracting Officer, is equal to that named in the specification, unless otherwise specifically

provided in this contract." This statement shall apply to all references made in these specifications to equipment, material, articles, or process.

1.04 REQUIREMENTS OF REGULATORY AGENCIES

A. Perform all work in strict accordance with the latest edition of all local, state and federal codes.

1.05 CONTRACTOR USE OF PREMISES

A. General: Limit use of the premises to construction activities in the project site; allow for user occupancy.

B. Confine operations to areas indicated for construction. Portions of the building beyond these areas are not to be disturbed. Keep all areas clean at all times.

1.06 NOTIFICATION

A. The Contractor shall provide written notification to the Contracting Officer. This notification shall be a minimum of 7 days prior to the commencement of construction at each unit or portion of the building(s). [For housing contracts, include the following: The Contractor shall provide written notification to each resident. This notification shall be a minimum of 7 days prior to the commencement of construction or interruption of utility at each unit.] Contractor notification shall include:

1. Street and unit number.

2. Demolition and construction designation.

3. Construction commencement date.

4. Work hours, expected noise and vibration levels.

5. Utility interruptions, date and hours of interruptions.

6. Construction completion date.

7. Instructions for each resident to remove all personal items from the immediate area so as to allow work to proceed.

8. Notification to resident that during the duration of work, the resident must be present.

9. Contractor's representative's name and phone number to contact for coordination issues.

10. Base CE Construction Manager's name and phone number to contact for problems that can not be resolved with the contractor.

1.07 QUALIFICATIONS OF WORKERS

A. The Contractor shall hire personnel qualified for the work which they are to perform. Such personnel shall possess the required training and/or license as would normally be required by industry standard. This shall include, but not be limited to, licensed electricians and plumbers.

1.08 DESIGNATION OF TECHNICAL REPRESENTATIVE

A. The Base Civil Engineer or his authorized representative is designated as the technical representative of the Contracting Officer for the purpose of technical surveillance of workmanship and inspection of materials for work being performed under this contract. This provision in no way authorizes anyone other than the Contracting Officer to commit the Government to changes in terms of the contract.

1.09 WORK CLEARANCE PERMIT

The designer is responsible for locating all utilities on the utility site plan and should use the following information for this section:

A. The 92d Civil Engineer Squadron Construction Manager shall provide the Contractor with a completed AF Form 103, "Base Civil Engineering Work Clearance Request". Attached will be a utility site plan. It shall be the responsibility of the Contractor to physically locate all utilities indicated on the utility site plan.

However, if the designer does not provide a utility site plan, the following information shall be used for this section:

A. A request for a Work Clearance Permit shall be submitted by the Contractor prior to beginning physical construction. The submittal shall include a Contractor initiated AF Form 103, "Base Civil Engineering Work Clearance Request" (the Contractor shall complete blocks 1, 2, 3, 5, 6, and 7). The Government will require fifteen (15) work days for processing the AF Form 103, therefore, the contractor shall schedule his submittal accordingly.

B. The submittal shall be made only after the Contractor has clearly marked the limits of all proposed excavations. Marking shall be in accordance with the American Public Works Association Uniform Color Code as adopted by the Washington State Utilities Coordinating Council (i.e., white paint/stakes).

C. The Base Civil Engineering Work Clearance Request shall include four (4) copies of a site plan which clearly depicts how the limits of all proposed excavations are marked and

indicates the maximum depth of excavation (the limits of the proposed excavation shall be drawn in a color other than black).

D. Upon receipt of the Base Civil Engineering Work Clearance Request, the Government will complete the remainder of the form. As part of the AF Form 103 approval process, the Government will locate and mark underground utilities within the limits of the proposed excavations (all Government locates shall be assumed to be accurate within +/- 24 inches of the actual utility). Note that in some instances the locating agency will provide a phone number for the Contractor to call to schedule specific locates.

E. Once the Government marks existing utilities, the contractor is responsible for maintaining the marks. The contractor will be charged a fee if existing utilities must be remarked because the contractor failed to maintain Government markings.

1.10 ACCESS ROUTE

A. Use only the approved routes to and from storage, work and disposal areas. Confine all operations and maintenance of tools and equipment, parking of vehicles and storage of items to areas designated on the drawings.

1.11 ACCIDENT PREVENTION

A. Comply with all pertinent provisions of the Corps of Engineers Manual EM 385-1-1, current edition, entitled "Safety and Health Requirements Manual". Compliance shall include, but not be limited to, the submittal of a **site specific** Safety and Health Plan, as described in the above referenced manual, to the Government for review and approval.

B. Furnish, post, maintain and remove guardrails, barricades and construction warning signs in sufficient number and at appropriate locations to protect and safeguard base personnel, property and operations during construction.

1.12 FIRE PREVENTION

A. It is the inherent responsibility of the Contractor to practice good fire prevention measures while working on Fairchild Air Force Base. Questions concerning fire prevention can be referred to the Technical Services Section at extension 247-2552. The following criteria shall be adhered to at all times during the contract work.

1. Flammable paints, oils, etc., must be stored in containers within a controlled area.

2. Temporary wiring must be in compliance with Article 305 of the National Electrical Code.

3. No welding/cutting and open flame operations are allowed in facilities when automatic detection and suppression systems are out of service. Welding, cutting or brazing shall only be done under approval of the Base Fire Department.

4. Automatic fire detection and suppression systems shall be returned to service during construction and renovation projects (if possible) when facility is unoccupied.

5. Contractor posts a fire guard for twenty four (24) hours (or certifies the facility fire safe) after welding/cutting and open flame operations in facilities when:

   a. Fire detection/sprinkler systems cannot be returned to service.
   b. Fire detection/sprinkler systems do not exist.

6. Fire extinguishers required during construction shall be supplied by the Contractor.

7. The Fire Department must be notified of and approve any access or street blockage prior to the actual action. Access must be available for Fire Department response at all times. Refer to paragraph 1.28 of this section for coordination requirements.

8. The Base Fire Chief must approve any water main shut off, or use of water from fire hydrants. The Base Fire Department shall be notified one full workday prior to actual shut-off of any water mains.

1.13 INTERRUPTION OF UTILITY SERVICES

A. The Government may not be held responsible for interruptions of utility service and will not be liable for contractor delays, damages, or increased costs occasioned by any such interruption of service.

1.14 UTILITY OUTAGES

A. All outages shall be coordinated with the using agency through the Contracting Officer or his representative. Written notice shall be provided by the contractor to the Contracting Officer not less than three (3) weeks prior to the required outage whenever areas outside the project limits are affected by the outage (one week prior notice is adequate if only the subject facility within the project limits is affected) . All work shall be coordinated and arranged to insure that the outage shall be of minimal duration. In the event a scheduled outage is canceled by the Government, notification will be given to the contractor at least 24 hours in advance of the time for the outage to start and the contractor shall reschedule outage for the soonest possible, mutually agreeable, time. Once an outage is arranged and work begun, work must go on until utilities are restored to the affected line(s) and/or facility.

1.15 RECORD DRAWINGS

A. Additional record drawings showing existing underground utilities may be made available by the Government. Contractor shall avail himself of the drawings. Any utility line shown on the contract or record drawings or made known to the contractor and damaged during construction work, shall be repaired immediately by the contractor at no cost to the Government.

1.16 WORK SCHEDULE

A. Working hours for the contractor shall normally between the hours of 7:30 am and 4:30 pm excluding Saturdays, Sundays, and Federal holidays. If the contractor desires to work during periods other than above, additional Government inspection forces may be required. The contractor must notify the Contracting Officer three working days in advance of his intention to work during other periods to allow assignment of additional inspection forces when the Contracting Officer determines they are reasonably available. If such force is reasonably available, the Contracting Officer may authorize the contractor to perform work during periods other than normal hours/days, however, if inspectors are required to perform in excess of their normal hours/days solely for the benefit of the contractor, the actual cost of inspection at overtime rates will be charged to the contractor. These adjustments to the contract price may be made periodically as directed by the Contracting Officer.

1.17 SMOKING IN AIR FORCE FACILITIES

A. Contractors are advised that the Commander has placed restrictions on the smoking of tobacco products in Air Force facilities. Contractor employees and visitors are subject to the same restrictions as are government personnel. Smoking is permitted only in designated smoking areas.

1.18 AVAILABILITY OF UTILITY SERVICES

A. Notwithstanding the provisions of Contract Clause, "Availability and Use of Utility Services," the Government will provide utilities (water, gas, and electricity) for project work areas during the performance period of this contract if available. At remote project work areas where no utilities are available, the contractor shall furnish his own utility services. No utilities will be provided by the Government at the contractor open storage area.

1.19 WATER SUPPLY

A. When required, the contractor will be furnished a water supply from a fire hydrant selected by the Contracting Officer with the written coordination of the Chief, Fire Technical Services. Exceptions will be in the case of a significant drop in water pressure on the system degrading the protection of facilities and lives. The contractor shall install his own gate valve on the fire hydrant. Government personnel will turn on the hydrant valve, leaving it on for the contractor's operation through his gate valve. Only Government personnel will operate the

fire hydrant valve. If the contractor attempts to operate the hydrant valve, he shall be liable for all damages to the fire hydrant casing, valve stem, or lug.

1.20 SEVERE WEATHER WARNING

A. Upon receipt by the Contracting Officer of a severe weather warning, the following sequence of actions will be carried out. The Contracting Officer will notify the contractor of the severe weather warning. The Contracting Officer will instruct the contractor to secure all his materials and equipment. The contractor shall take immediate action to tie down, remove, protect, or secure his materials and equipment to the satisfaction of the Air Force Inspector in order to reasonably assure that Government Property will not be damaged. If the contractor fails or refuses to secure materials and equipment to the satisfaction of the Air Force inspector, the work will be accomplished by Air Force personnel and the cost thereof charged to the contractor.

1.21 AREA CLEAN-UP

A. The Contractor shall at all times keep the construction area, including storage areas used by the Contractor, free from accumulation of waste materials and rubbish. Prior to completion of work each day, remove from the construction site all waste materials and rubbish.

B. All mud, dirt, debris, foreign objects or spills of any kind from the Contractor's operations (including subcontractors and suppliers) on streets, hard surfaces, and parking lots used as access to the work or staging areas shall be cleaned off the same day.

C. Upon completion of the construction, the Contractor shall leave the work premises in a clean and neat condition satisfactory to the Contracting Officer. This shall be the required condition at the time of acceptance of all work under this contract.

1.22 CONSTRUCTION SITE MAINTENANCE

A. All supplies and equipment on the project site shall be stored so as to preclude mechanical and climatic damage. Site shall be maintained in a neat and orderly manner. Visual screening shall be required for outside construction sites to maintain a neat appearance.

1.23 REMOVAL AND REPLACEMENT RESPONSIBILITY

A. The contractor shall be responsible for the replacement or repair of all existing finished surfaces, utilities, equipment, landscape and grounds, and structures or parts thereof that he damaged, removed, cut, or disturbed in the course of completing the work specified.

1.24 CONTRACTOR PARKING

A. Contractor vehicles and equipment shall be parked in a designated area. The contractor shall be responsible for maintaining security for contractor-owned equipment/vehicles as well as for materials stored by the contractor. The contractor shall not be permitted to park or run vehicles on grass areas. Any damage done to lawns or shrubs shall be repaired or replaced by the contractor.

1.25 WARRANTY

1. The contractor shall honor all warranty requirements. Except as noted otherwise, the contractor shall perform warranty work no later than 15 calendar days after notification by the Contracting Officer, and not later than 7 calendar days on second and subsequent attempts by the contractor to correct a deficient item.

1.26 CONTRACTING OFFICER'S AUTHORITY

A. No person other than a Contracting Officer will have authority to modify the terms of this agreement. The Contracting Officer is the only person authorized to approve changes in any of the requirements under this agreement and notwithstanding any provisions contained elsewhere in this agreement, the said authority remains solely with the Contracting Officer. In the event the contractor effects any such change at the direction of any person other than the Contracting Officer, the change will be considered to have been made without authority and no adjustment will be made in the contract price to cover any increase in costs incurred as a result thereof.

1.27 SANITARY FACILITIES

A. The contractor shall provide his own chemical sanitary toilets at the work site, separate from his field office. Chemical toilets must be serviced regularly, and will be subject to Government inspection by the Base Medical Officer. All sanitary deficiencies shall be corrected within 24 hours of the inspection.

1.28 COORDINATION WITH GOVERNMENT ACTIVITIES

A. If it becomes necessary to interrupt work activities in buildings and/or areas for construction purposes, permission to do so must be requested in writing to the Contracting Officer five (5) working days in advance. Written requests for street closings shall be submitted for approval five (5) working days prior to closing of the street. The Contracting Officer will coordinate with the staff Civil Engineer. Any temporary construction for facilities used by the contractor for preventing interruption of normal work activity or loss of utilities services shall be subject to approval of the staff Civil Engineer through the Contracting Officer.

1.29 PHYSICAL DATA

A. Meteorological data furnished from the 92d Operations Support Squadron Weather Division at Fairchild AFB, WA will be used to determine time extensions due to abnormally severe weather.

1.30 APPROVAL TO USE RADIOACTIVE MATERIALS

A. Prior to bringing radioactive material on Fairchild AFB (contained in monitoring/testing equipment, for example) notify base Bioenvironmental Engineering, 92 AMDS/SGPB, of the dates and times the equipment will be on base. This can be done as a telephone notification to (509) 247-2391, or fax message to (509) 247-2761. Include Radioactive Material Permits, Certificates of Training, Operation Procedures and leak test records as submittal items in the specifications for Bioenvironmental Engineering approval before radioactive material is brought on base.

1.31 IDENTIFICATION CARDS AND VEHICLE PASSES

A. All security requirements and procedures shall be coordinated with the 92d Security Forces Squadron, FAFB. All activities of the contractor and his employees and subcontractors and their employees while on base shall be conducted in strict accordance with all base regulations, including those of the fire Marshall as well as security directives

B. All contractor employees required to enter FAFB in the performance of this contract must first be issued an AF Form 75 for identification purposes. This identification must be readily accessible at all times within the confines of FAFB. If an employee is dismissed from employment, resigns, or if there is no longer a contractual requirement for the employee to enter FAFB, the contract's project manager or alternate shall ensure that the AF Form 75 and any other identification, i.e., vehicle passes, issued to the employee are expeditiously returned to the Contracting Squadron, 92 CONS/LGCK prior to final payment. If all identification is not provided, a portion of the final payment (to be determined by the Contracting Officer) will be withheld pending its submission.

C. At the Pre-performance Conference, the contractor will be issued sufficient blank applications for issuance of AF Form 75. These applications are to be completed by typewriter or legibly in ink. The applications, when completed, shall be hand carried to the Contracting Office for signature. After signature by the Contracting officer (or representative thereof), contractor employees shall hand carry the applications to the Security Forces Administration and Reports Branch (92 SPTG/SFA), Bldg. 2071, FAFB. The Administration and Reports Branch will process the applications as follows: Non-Flightline Passes: three (3) workdays; Flightline Passes: five (5) working days. Upon processing, the Administration and Reports Branch will forward the pass application to the Security Forces Pass and Identification Section (92 SPTG/SFAP), Bldg. 4325, to accomplish photographs of contractor personnel and issuance of the Visitor/Vehicle Pass, AF Form 75.

D. Contractor identification cards will be issued for the performance period of the contract only, or for 1 year, whichever is the shorter period of time. Passes for contractor personnel where the performance period extends beyond 1 year, or where the contract is extended beyond the

original scheduled completion date, will have to be reissued. Procedures for reissue will be the same for the original issue.

E. Contractor personnel will be made aware by the Contracting Officer and the contractor's project manager of the necessity for safeguarding identification cards issued and the requirement for reporting any identification cards lost.

F. The 92 Security Forces Squadron (92 SFS) no longer issues temporary five-day passes while personnel are awaiting the completion of background checks required for permanent passes. The 92 SFS will not issue a permanent pass until completion of the applicant's background check.

1. Each individual requiring a Base Pass must complete a Request for Issuance of Base Pass form. The completed application and a copy of the applicant's picture ID will be hand-carried by the prime contractor's Superintendent (or other person approved by the Contracting Officer) to the appropriate Contracting Office (92 Contracting or Army Corp of Engineers) for signature. Once signed by the Contracting Office, the application will be hand-carried to the Security Forces Law Enforcement Desk (Building 2071) where a Wants and Warrants check will be processed on the applicant. Allow up to 48 hours for processing by Security Forces.

2. 92 Contracting or Army Corp of Engineers personnel will verify the need for an immediate pass and mark the application with "Immediate Processing Requested." 92 Contracting or Army Corp of Engineers personnel will annotate this statement with a signature block stamp. 92 SFS personnel will work these passes as soon as possible depending on current operations.

3. Personnel requesting passes during a verifiable weekend or after-hours emergency situation will receive a temporary pass for a limited time frame (i.e. 1700/Friday until 0800/Monday. The 92 SFS will issue these passes only after the completion of the required background check.

4. When processing is completed, the form will be forwarded to Pass and Registration at the Front Gate where the applicant will appear, in person, to have the pass issued.

G. 92 SFS installation entry controllers will check <u>all</u> contractor personnel for their pass during installation entry.

1. If contractor personnel do not have their pass with them, 92 SFS personnel will direct the contractor to Pass and Registration in order to verify issuance of a pass. If the contractor has a valid pass issued, they may proceed onto the installation. Pass and Registration personnel will confirm pass status with the entry controller.

2. Graham Road gate entry controllers will direct contractor personnel without passes to Pass and Registration for pass verification.

3. Personnel who do not have a pass issued will not be allowed to enter the installation until 92 SFS issues a permanent pass.

H. Contractors are no longer allowed to vouch employees or subcontractor personnel onto the installation. Contractors must provide written notification to the appropriate Contracting Officer of any "temporary" personnel who require access to Fairchild. The notification must include the name, social security number and driver's license or state identification number of the temporary worker. It must also state how long the worker will require access to the base.

I. Contractors may continue to identify up to three personnel who are allowed to vouch **deliveries** onto the installation in order to continue operations. (Delivery drivers should have a bill of lading or a material delivery ticket.)

J. Contractors are reminded that vehicles can not be left parked at the Front (Main) Gate area. This area is 30 minute parking only. If you have employees who can not drive on base (lack of insurance, registration, suspended license, etc.) they can leave their vehicle at the Back (Graham Road) Gate parking area.

K. Vendors and delivery vehicles: For vendors and personnel driving delivery vehicles, the contractor shall furnish rosters to the Contracting Officer and Law Enforcement Superintendent 48 hours in advance of required access to the base. When time does not permit, the contractor shall contact the Law Enforcement Superintendent's office at (509) 247-5546 with the name of the delivery vehicle driver, name of company, and approximately what time, date, and number of vehicles that require entry to the base. In addition, the contractor shall provide the Law Enforcement Superintendent with a telephone call back number for verification of the delivery information provided.

L. Commercial and company vehicles will be allowed access to the base, provided company emblems are attached to the sides of the vehicles and operators present required identification credentials as described herein.

M. Any questions should be directed to your respective Contracting Officer.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION

DIVISION 1

SECTION 01040 - COORDINATION

A. When developing specifications for this section, use the standard Fairchild Air Force Base specifications developed by the 92d Civil Engineer Squadron Engineering Flight and edit for the specific project. See attached specification for example.

B. The contractor shall submit all requests for information (RFIs) in writing on the approved form included at the end of this section. RFIs received in any other format or on any other form will be rejected by the Government.

END OF SECTION

SECTION 01040 - COORDINATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes administrative and supervisory requirements necessary for coordinating construction operations including, but not necessarily limited to, the following:

1. General project coordination procedures.

2. Conservation.

3. Coordination Drawings.

4. Administrative and supervisory personnel.

5. Cleaning and protection.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Submittals" for preparing and submitting the Contractor's Construction Schedule.

2. Division 1 Section "Materials and Equipment" for coordinating general installation.

3. Division 1 Section "Contract Closeout" for coordinating contract closeout.

1.03 COORDINATION

A. Coordinate construction operations included in various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in the sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.

2. Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.

3. Make provisions to accommodate items scheduled for later installation.

B. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

1. Prepare similar memoranda for the Government and separate contractors where coordination of their work is required.

2. The contractor shall submit all requests for information (RFIs) in writing on the approved form included at the end of this section. RFIs received in any other format or on any other form will be rejected by the Government. A separate form shall be submitted with each RFI.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of schedules.

2. Installation and removal of temporary facilities.

3. Delivery and processing of submittals.

4. Progress meetings.

5. Project closeout activities.

D. Conservation: Coordinate construction operations to assure that operations are carried out with consideration given to conservation of energy, water, and materials.

1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work.

1.04 SUBMITTALS

A. Coordination Drawings: Prepare coordination drawings where careful coordination is needed for installation of products and materials fabricated by separate entities. Prepare coordination

drawings where limited space availability necessitates maximum utilization of space for efficient installation of different components.

1. Show the relationship of components shown on separate Shop Drawings.

2. Indicate required installation sequences.

3. Comply with requirements contained in Section "Submittals."

B. Staff Names: Within 15 days of commencement of construction operations, submit a list of the Contractor's principal staff assignments, including the superintendent and other personnel in attendance at the Project Site. Identify individuals, their duties, and their telephone numbers.

1. Post copies of the list in the Project meeting room, the temporary field office, and each temporary telephone.

PART 2 - PRODUCTS (Not Applicable)

PART 3 – EXECUTION

3.01 GENERAL COORDINATION PROVISIONS

A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.

3.02 CLEANING AND PROTECTION

A. Clean and protect construction in progress and adjoining materials in place, during handling and installation. Apply protective covering where required to assure protection from damage or deterioration at Substantial Completion.

B. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to assure operability without damaging effects.

C. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

REQUEST FOR INFORMATION

Company Name _____ Request for Information Number: _____
Project Name:_____ Date of Request:_____
Contract Number:_____ Reference Location of Problem:
Superintendent Name:_____ Plans _____ or Specs_____
CQC Name:_____ Circle: Cost Potential: Y N Time Potential: Y N
Description of Problem/Question with proposed solution:

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FOR GOVERNMENT USE

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Construction Manager_____ Date:_____
Contracting Officer_____ Date:_____
Forwarded By:_____ Date:_____

DIVISION 1

SECTION 01045 - CUTTING AND PATCHING

A. When developing specifications for this section, use the standard Fairchild Air Force Base specifications developed by the 92d Civil Engineer Squadron Engineering Flight and edit for the specific project. See attached specification for example.

END OF SECTION

SECTION 01045 - CUTTING AND PATCHING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes administrative and procedural requirements for cutting and patching.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Coordination" for procedures for coordinating cutting and patching with other construction activities.

2. Division 2 Section "Selective Demolition" for demolition of selected portions of the building for alterations.

3. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

a. Requirements of this Section apply to mechanical and electrical installations. Refer to Division 15 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.03 SUBMITTALS

A. Cutting and Patching Proposal: Submit a proposal describing procedures well in requires approval of these procedures before proceeding. Request approval to proceed. Include the following information, as applicable, in the proposal:

1. Describe the extent of cutting and patching required. Show how it will be performed and indicate why it cannot be avoided.

2. Describe anticipated results in terms of changes to existing construction. Include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.

3. List products to be used and firms or entities that will perform Work.

4. Indicate dates when cutting and patching will be performed.

5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.

6. Where cutting and patching involves adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with the original structure.

7. Approval by the Government to proceed with cutting and patching does not waive the Government's right to later require complete removal and replacement of unsatisfactory work.

1.04 QUALITY ASSURANCE

A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would change their load-carrying capacity or load-deflection ratio.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements:

a. Foundation construction.
b. Bearing and retaining walls.
c. Structural concrete.
d. Structural steel.
e. Lintels.
f. Timber and primary wood framing.
g. Structural decking.
h. Stair systems.
i. Miscellaneous structural metals.
j. Exterior curtain-wall construction.
k. Equipment supports.
l. Piping, ductwork, vessels, and equipment.
m. Structural systems of special construction in Division 13 Sections.

B. Operational Limitations: Do not cut and patch operating elements or related components in a manner that would result in reducing their capacity to perform as intended. Do not cut and patch operating elements or related components in a manner that would result in increased maintenance or decreased operational life or safety.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:

    a. Primary operational systems and equipment.
    b. Air or smoke barriers.
    c. Water, moisture, or vapor barriers.
    d. Membranes and flashings.
    e. Fire protection systems.
    f. Noise and vibration control elements and systems.
    g. Control systems.
    h. Communication systems.
    i. Conveying systems.
    j. Electrical wiring systems.
    k. Operating systems of special construction in Division 13 Sections.

C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in the Government's opinion, reduce the building's aesthetic qualities. Do not cut and patch construction in a manner that would result in visual evidence of cutting and patching. Remove and replace construction cut and patched in a visually unsatisfactory manner.

    1. If possible retain the original Installer or fabricator to cut and patch the exposed Work listed below. If it is impossible to engage the original Installer or fabricator, engage another recognized experienced and specialized firm.

        a. Processed concrete finishes.
        b. Stonework and stone masonry.
        c. Ornamental metal.
        d. Matched-veneer woodwork.
        e. Preformed metal panels.
        f. Firestopping.
        g. Window wall system.
        h. Stucco and ornamental plaster.
        i. Acoustical ceilings.
        j. Terrazzo.
        k. Finished wood flooring.
        l. Fluid-applied flooring.
        m. Carpeting.
        n. Aggregate wall coating.
        o. Wall covering.
        p. Swimming pool finishes.
        q. HVAC enclosures, cabinets, or covers.

1.05 WARRANTY

A. Existing Warranties: Replace, patch, and repair material and surfaces cut or damaged by methods and with materials in such a manner as not to void any warranties required or existing.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL

A. Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible if identical materials are unavailable or cannot be used. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 - EXECUTION

3.01 INSPECTION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed before cutting. If unsafe or unsatisfactory conditions are encountered, take corrective action before proceeding.

1. Before proceeding, meet at the Project Site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.02 PREPARATION

A. Temporary Support: Provide temporary support of work to be cut.

B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Avoid cutting existing pipe, conduit, or ductwork serving the building but scheduled to be removed or relocated until provisions have been made to bypass them.

3.03 PERFORMANCE

A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

B. Cutting: Cut existing construction using methods least likely to damage elements retained or adjoining construction. Where possible, review proposed procedures with the original Installer; comply with the original Installer's recommendations.

1. In general, where cutting, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

3. Cut through concrete and masonry using a cutting machine, such as a Carborundum saw or a diamond-core drill.

4. Where services are required to be removed, relocated, or abandoned, by-pass utility services, such as pipe or conduit, before cutting. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.

C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.

2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

3. Where removing walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

a. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing the patch after the area has received primer and second coat.

4. Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

3.04 CLEANING

A. Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar items. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.

END OF SECTION

DIVISION 1

SECTION 01300- SUBMITTALS

A. When developing specifications for this section, use the standard Fairchild Air Force Base specifications developed by the 92d Civil Engineer Squadron Engineering Flight and edit for the specific project. See attached specification for example.

B. Contractor shall prepare a complete and detailed Submittal Register to be submitted to the Contracting Officer using an AF Form 3000. (This applies to all projects solicited through the FAFB Contracting Office. For CoE projects, use the ENG Form 4288.) The information shall be developed from the submittal requirements of the contract documents, including the individual specification sections and the drawings.

C. Designer shall make an effort to reduce the number of required submittals.

END OF SECTION

SECTION 01300 - SUBMITTALS

PART 1- GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.02 DESCRIPTION OF WORK

A. This Section specifies administrative and procedural requirements for submittals required by the specifications.

B. Administrative Submittals: Refer to other portions of the Contract Documents for requirements for administrative submittals.

1.03 DEFINITIONS

A. Shop Drawings include specially prepared technical data for this project, including drawings, diagrams, schedules, measurements, and similar information not in standard printed form for general application to a range of similar projects.

B. Product Data includes standard printed information on materials, products and systems.

C. Samples include physical examples of materials, either for limited visual inspection or (where indicated) for more detailed testing and analysis.

D. Miscellaneous Submittals include warranties, maintenance agreements, bonds, data and reports, physical work records, quality testing and certifying reports, record drawings, field measurement data, and operating and maintenance materials that are related directly to the work and are not processed as shop drawings, product data, or samples.

1.04 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with the performance time of the contract. Transmit each submittal sufficiently in advance to ensure completion within the stated performance time.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.

    a. The Government reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

2. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.

    a. Allow two weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Government will promptly advise the Contractor when a submittal being processed must be delayed for coordination.

    b. If an intermediate submittal is necessary, process the same as the initial submittal. Allow two weeks for reprocessing each submittal.

    c. No extension of Contract Time will be authorized because of failure to transmit submittals to the Government sufficiently in advance of the Work to permit processing.

B. Contractor Review: Prior to submittal, each respective line item on every transmittal form (AF Form 3000) shall be reviewed, signed and dated by the Contractor's Quality Control representative certifying that the accompanying submittal complies with the contract requirements.

1. Provide a Contractor Submittal Review label or stamp for each submittal line item, including Shop Drawings, to record the Contractor's review and approval markings.
2. Include the following information on the label/stamp:

    a. Name of Contractor
    b. Submittal Number
    c. Line Item Number
    d. Action Taken
    e. Date of Review
    f. CQC Representative Signature

1.05 SUBMITTAL REGISTER

A. Prepare a complete and detailed Submittal Register (sample blank form provided herein) to be submitted to the Contracting Officer using an AF Form 3000. The information shall be

developed from the submittal requirements of the contract documents, including the individual specification sections and the drawings.

1. List all submittals required by the contract documents. SUBMITTAL NUMBER shall be sequential (eg., 1, 2, 3, 4, etc.). Resubmittals shall retain the original number and add an alphabetic suffix (eg., 1A, 1B, 1C, etc.).

2. Mark the form with the SUBMITTAL TYPE required.

3. Mark the calendar date for REQUIRED SUBMISSION DATE to comply with the contract performance criteria.

4. Products and materials the Contractor provides identically as specified will not require the submittal of an AF Form 3000. The item shall be entered with a submittal number, contract reference, and a note in the REMARKS that includes the item name, model number, and other data for identification, and the words "IAW specs". The DATE columns shall be annotated "NA".

5. All other types of submittals require the completion and submittal of the AF Form 3000 as required by the contract documents. These shall include all items specifically requiring Government approval, including product variances and substitutions, shop drawings, color samples, test results, etc. Contractors shall not submit multiple items on one AF Form 3000. If one item on the form is disapproved, **all** items will be disapproved.

6. Contractor shall review, update, and resubmit the Submittal Register via an AF Form 3000 at least every 30 days to reflect additions, item changes, and date changes to keep it current.

1.06 SHOP DRAWINGS

A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the contract documents. Do not reproduce contract documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the project is not considered Shop Drawings.

B. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:

1. Dimensions.

2. Identification of products and materials included.

3. Compliance with specified standards.

4. Notation of coordination requirements.

5. Notation of dimensions established by field measurement.

6. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2" x 11" but no larger than 36" x 48".

C. Coordination Drawings are a special type of Shop Drawing that show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or function as intended.

1. Preparation of Coordination Drawings is specified in section "Project Coordination" and may include components previously shown in detail on Shop Drawings or Product Data.

2. Submit Coordination Drawings for integration of different construction elements. Show sequences and relationships of separate components to avoid conflicts in use of space.

1.07 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."

B. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:

1. Manufacturer's printed recommendations.

2. Compliance with recognized trade association standards.

3. Compliance with recognized testing agency standards.

4. Application of testing agency labels and seals.

5. Notation of dimensions verified by field measurement.

6. Notation of coordination requirements.

1.08 SAMPLES

A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.

B. Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Include the following:

1. Generic description of the Sample.

2. Sample source.

3. Product name or name of manufacturer.

4. Compliance with recognized standards.

5. Availability and delivery time.

C. Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.

1. Where variation in color, pattern, texture or other characteristics are inherent in the material or product represented, submit multiple units (not less than 3), that show approximate limits of the variations.

2. Refer to other specification sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation and similar construction characteristics.

3. Field Samples are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the work shall be judged.

1.09 PROJECT RECORD DOCUMENTS

A. Job Set: Maintain a complete set of Contract Documents (Drawings and Project Manual) in good condition at the job site. Annotate the Job Set as work progresses to reflect installations which vary from the work originally shown (include change order numbers where applicable). Make the Job Set available for review at the Contracting Officer's request.

B. Review: The Job Set drawings shall be submitted to Contracting Office for review before the contract will be considered substantially complete.

C. Reproducible Set: The contractor shall revise all Contract Drawings based on the reviewed Job Set; each sheet of these drawings shall be stamped “Record Drawing”. A reverse sepia

reproducible set of all Record Drawings shall be submitted within 14 calendar days after receipt of the approved Job Set.

1.10 GOVERNMENT ACTION

A. The Government will review each submittal, mark to indicate action taken. Compliance with specified characteristics is the Contractor's responsibility.

B. Final Unrestricted Release: Where submittals are marked "Approved," that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.

C. Final-But-Restricted Release: When submittals are marked "Approved as Noted," that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.

D. Returned for Resubmittal: When submittal is marked "Disapproved," do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark. Do not permit submittals marked "Disapproved," to be used at the Project site, or elsewhere where Work is in progress.

E. Other Action: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked "Action Not Required".

1.11 APPROVED SUBMITTALS

A. The approval of submittals by the Contracting Officer shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error which may exist. The Contractor, under the CQC requirements of this contract, is responsible for the dimensions and design of adequate connections, details and satisfactory construction of all work. After submittals have been approved by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be given consideration unless accompanied by an explanation as to why a substitution is necessary.

1.12 DISAPPROVED SUBMITTALS

A. The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies as specified for the initial

submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, they shall promptly notify the Contracting Officer.

PART 2 - PRODUCTS

2.01 ENVIRONMENTAL AND HAZARDOUS MATERIAL HANDLING

A. The contractor shall be required to maintain Material Safety Data Sheets (MSDS) for all hazardous materials in accordance with base and federal guidelines. The contractor shall submit to the Contracting Officer at the beginning of the contract a list of the hazardous materials he is bringing on base for performance of the contract. The list shall include all materials to be used by the prime contractor and all subcontractors. The list will include estimated quantities of each hazardous material that is contemplated to be used during the course of the contract. The contractor will also provide a copy of the MSDS for each product identified on the list. At the end of the contract, the contractor shall submit to the Contracting Officer a list of products and the quantity of each that the contractor is taking off base when the project is completed. Any questions concerning hazardous materials shall be directed to the Contracting Officer.

PART 3 - EXECUTION

3.01 GENERAL

A. The Contractor is responsible for, and shall submit all items specified in these specifications. Further, the Contracting Officer may request submittals in addition to those listed when deemed necessary to ensure compliance with the requirements of the specification sections.

B. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including, but not limited to, catalog cuts, diagrams, operating charts or curves; test reports; samples; O&M manuals, including parts list; certifications; warranties and other such required submittals.

C. All submittals shall include one (1) completed AF Form 3000 and four (4) copies of all attachments. Two (2) completed copies of the AF Form 3000 with attachments will be returned to the contractor for action.

3.02 SUBMITTAL REGISTER

A. At the end of this section is one sample copy of the Submittal Register. The Contractor shall submit 4 copies of the completed Submittal Register for Government approval within 10

calendar days after Award. In preparing the document, adequate time shall be allowed for review and approval and possible resubmittal as specified below. The approved Submittal Register is the scheduling document and shall be used to control submittals throughout the life of the contract.

3.03 SCHEDULING

A. Submittals shall be scheduled, made and approved prior to the acquisition of the material or equipment covered thereby. Likewise, all transmittals, specifically shop drawings, shall be scheduled, made, and approved, prior to the start of construction on a respective area. Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. No delays, damages or time extensions will be allowed for time lost in late or unsatisfactory submittals.

3.04 MATERIAL APPROVAL SUBMITTAL (AF Form 3000)

A. The Material Approval Submittal, AF Form 3000, shall be used for submitting all submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care shall be exercised to ensure proper listing of the specification section and paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item. Each AF Form 3000 shall be submitted for each item. When multiple items are submitted on an AF Form 3000, and any item is disapproved, all items on a single form will be disapproved.

3.05 VARIATIONS AND SUBSTITUTIONS

A. For submittals which include proposed variations requested by the Contractor, the Contractor shall set forth in writing the justification for any variations and annotate such variations on the submittal in the “Comments” section. Likewise, no submittal of a substitution of an “or equal” material or equipment will be accepted without a justification that demonstrates to the Government’s satisfaction that the item is, in fact, equal to the specified item and meets all requirements. This justification shall include specific references to the respective specification section and all requirements therein. The justification shall also include a comparison of the salient characteristics of the specified and submitted items.

END OF SECTION

DIVISION 1

SECTION 01400 - QUALITY CONTROL

A. When developing specifications for this section, use the standard Fairchild Air Force Base specifications developed by the 92d Civil Engineer Squadron Engineering Flight and edit for the specific project. See attached specification for example.

B. Quality Control (QC) shall be provided for the entire project. Responsibility for accomplishing QC is the Contractor's. Specific QC requirements are as listed herein. The QC system shall consist of plans and procedures necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both on and off-site, and shall be keyed to the proposed construction sequence.

C. Contractor shall hire ICBO-certified testing laboratories and shall also bear the costs for all inspections and testing of materials and equipment. This requirement supersedes and takes precedence over any other document that states or implies that the Government is responsible for these costs.

END OF SECTION

SECTION 01400 - QUALITY CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, general provisions of the contract, and other Division-1 specification sections apply to the work of this section.

1.02 DESCRIPTION OF WORK

A. All labor, materials, equipment and services necessary to accomplish the work of this section as indicated or specified herein.

B. Quality Control (QC) shall be provided for the entire project. Responsibility for accomplishing QC is the Contractor's. Specific QC requirements are as listed herein. The QC system shall consist of plans and procedures necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both on and off-site, and shall be keyed to the proposed construction sequence.

1.03 INSPECTION SERVICES

A. Accomplish work in an orderly progression of steps to satisfy performance requirements of this Specification.

B. Items of work to be concealed shall be Government inspected prior to concealment.

C. Notify Contracting Officer at least five working days prior to proposed date of final inspection. Final inspection shall be preceded by a prefinal inspection (multiple inspections if necessary) at which time a list of deficiencies will be furnished to the Contractor. Discrepancies noted in the prefinal inspection(s) shall be corrected by the Contractor and reinspected by the Government prior to final inspection of the work.

1.04 QUALITY ASSURANCE (QA)

A. Manufacturer: Obtain materials of each type required from a single manufacturer, to greatest extent possible. Provide secondary materials only as recommended by manufacturer of primary materials.

B. Installer: Firm(s) with not less than 3 years of successful experience in installation of specific materials and other components similar to requirements for this project and which is acceptable to manufacturer of primary materials.

C. As specified herein, provide the Government evidence needed to establish confidence that QC is being performed adequately.

D. Except as modified and supplemented herein, follow the published requirements and written recommendations of the materials manufacturers. Concerning methods of installation, industry practices apply only when this Contract does not address the matter.

E. The specified QA requirements are minimums. Also, do what is needed to fulfill the intent and requirements of FAR 52.246-12, Inspection of Construction.

F. The QC is subject to audit by a Government representative. Give the representative all information necessary for this audit. Government agents, including representatives, engineers, and quality assurance evaluators, are not authorized to change the Contract without the written authorization of the Contracting Officer; this lack of authority extends to all situations in which the actions of these agents could be construed as constituting a change.

G. Provide Quality Control defined as follows:

1. QC is the regulatory process by which the Contractor measures actual quality performance, compares it with standards, and acts on the difference. The quality function is the entire collection of activities through which fitness for use is achieved.

2. Contractor inspection is a careful and critical investigation of all work to assure that it conforms to the Contract, and to detect variances and act to correct them in time to prevent reworking and delay. This includes detailed, skillful examination and testing with immediate comparison to the requirements of the Contract. On discovery of variance, the Contractor will immediately institute corrective action to eliminate the variance and to ensure that all future work conforms to the requirements of the Contract.

3. Basic QC Requirements appear in paragraph 1.05 of this section. As a minimum, the QC shall perform each of the actions listed on a daily basis.

1.05 BASIC QUALITY CONTROL REQUIREMENTS

A. Introduction:

1. The Contractor shall ensure that the Government obtains products and services as required by the contract.

2. To accomplish this, the Contractor shall continuously observe work in progress, including testing and measuring, and report findings on a daily record form. The Government is

assured of "getting exactly what is required" when the record form does not contain any variances from the contract.

B. Before actual work begins, the Contractor shall:

1. Read and review the specifications and the drawings.

2. Visit the construction site and become familiar with its layout.

3. Attend the preconstruction conference.

4. A check to assure that all materials and/or equipment have been tested, submitted and approved.

5. A check to assure that provisions have been made to provide required control inspection and testing.

6. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

7. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawing or submitted data, and are properly stored.

8. A review of the appropriate activity hazard analysis to assure safety requirements are met.

9. Discussion of procedures for constructing the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that phase of work.

10. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

11. The Government shall be notified at least 48 hours in advance of beginning any of the required actions of the preparatory phase. This phase shall include a meeting conducted by the superintendent, other Contractor personnel (as applicable), and the foreman responsible for the definable feature. A definable feature of work is a task which is separate and distinct from other tasks and has separate control requirements. As a minimum, each section of the specifications shall be considered as a definable feature. However, there may be more than one definable feature under a section of the specifications, i.e., mechanical, electrical, etc. Invite the Government’s representative to each meeting. The results of the preparatory phase actions shall be documented by separate minutes prepared by the Contractor and attached to the daily QC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

C. Initial Phase: This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

1. A check of preliminary work to ensure that it is in compliance with contract requirements. Review minutes of the preparatory meeting.

2. Verification of full contract compliance. Verify required control inspection and testing.

3. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards.

4. Resolve all differences.

5. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

6. The Government shall be notified at least 48 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the Contractor and attached to the daily QC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.

7. The initial phase should be repeated for each new crew to work on-site, or any time acceptable specified quality standards are not being met.

D. Follow-up Phase: Daily checks shall be performed to assure continuing compliance with contract requirements, including control testing, until completion of the particular feature of work. The checks shall be made a matter of record in the QC documentation and shall document specific results of inspections for all features of work for the day or shift. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon or conceal non-conforming work.

E. Additional Preparatory and Initial Phases: Additional preparatory and initial phases may be conducted on the same definable features of work as determined by the Government if the quality of on-going work is unacceptable; or if there are changes in the applicable Contractor staff or in the on-site production supervision or work crew.

F. QC Record: Complete, daily as follows:

1. Items of Work:

a. Insert date and record no.
b. Insert weather description and temperature.
c. Indicate crew start and stop times.
d. Indicate your start and stop times.
e. Indicate exact location of work performed.

f. Indicate exact location of work previously completed.

2. Products.

a. Examine each material.
b. Assure that all materials comply with the contract. To determine compliance, compare the material with the project specifications and drawings, and also with the approved manufacturer's literature submitted.

3. Variances:

a. All variances require an explanation of the variance. The explanation should be limited to a description of the variance only; reasons for variance are not necessary.
b. Indicate action taken to resolve each variance to result in complying work. If a variance is not resolved on the same day it occurs, the record must be entered for all succeeding days, until the variance is resolved.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 CONTENT OF THE CQC PLAN

A. The CQC plan shall include, as a minimum, the following to cover all construction operations, both on-site and off-site, including work by subcontractors, fabricators, suppliers and purchasing agents:

B. Procedures for scheduling, reviewing, certifying and managing submittals, including those of subcontractors, off-site fabricators, suppliers and purchasing agents. These procedures shall be in accordance with Section 01300 SUBMITTALS.

C. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures will establish verification that identified deficiencies have been corrected.

D. Reporting procedures, including proposed reporting formats. This shall include a copy of the Daily QC report form.

3.02 ACCEPTANCE OF PLAN

A. Acceptance of the Contractor’s plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the

construction. The Government reserves the right to require the Contractor to make changes in his QC plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.03 NOTIFICATION OF CHANGES

A. After acceptance of the QC plan, the Contractor shall notify the Contracting Officer, in writing, a minimum of seven calendar days prior to any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.04 COORDINATION MEETING

A. After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the QC Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's QC system. During the meeting, a mutual understanding of the system details shall be discussed, including the forms for recording the QC operations, control activities, testing, administration of the system for both on-site and off-site work, and the interrelationship of Contractor's Management and control with the Government's QA. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.05 QUALITY CONTROL ORGANIZATION

A. The Contractor shall identify an individual within his organization at the site of the work who shall be responsible for overall management of CQC and have the authority to act on all QC matters for the Contractor. This individual shall be on site at all times during construction and will be employed by the Contractor, except as noted in the following. An alternate person will be identified in the plan to serve in the event of the primary QC's absence. The requirements for the alternate will be the same as for the designated QC.

3.06 COMPLETION INSPECTION

A. At the completion of all work or any increment thereof established by a completion time stated in the Special Clause entitled "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the Superintendent shall conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved plans and specifications. Such a list of deficiencies shall be included in QC documentation, as required by paragraph DOCUMENTATION below, and shall include the estimated date by which the deficiencies will be corrected. The Superintendent or staff shall

make a second inspection to ascertain that all deficiencies have been corrected and so notify the Government. These inspections and any deficiency corrections required by this paragraph will be accomplished within the time stated for completion of the entire work or any particular increment thereof if the project is divided into increments by separate completion dates.

3.07 DOCUMENTATION

A. The Contractor shall maintain current records of QC operations, activities, and tests performed, including the work of subcontractors and suppliers. These records shall be on an acceptable form and shall be a complete description of inspections, the results of inspections, daily activities, tests, and other items, including but not limited to the following:

1. Contractor/subcontractor and their area of responsibility.

2. Operating plant/equipment with hours worked, idle, or down for repair.

3. Work performed today, giving locations, description, and by whom.

4. Test and/or control activities performed with results and references to specifications/plan requirements. The control phase should be identified (Preparatory, Initial, Follow-up). List deficiencies noted along with corrective action.

5. Material received with statement as to its acceptability and storage.

6. Material submittals reviewed, with contract reference by whom, and action taken.

7. Off-site surveillance activities, including actions taken.

8. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

9. List instructions given/received and conflicts in plans and/or specifications.

10. Contractor’s verification statement.

11. These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Government daily within 24 hours after the date(s) covered by the report, including reports that shall be submitted for days on which no work is performed. All calendar days shall be accounted for throughout the life of the contract. Reports shall be signed

and dated by the Primary QC. The report from the QC shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.08 SAMPLE FORMS

A. Sample Contractor QC Report forms are enclosed at the end of this section.

DAILY CONSTRUCTION QUALITY CONTROL REPORT

DAILY CONSTRUCTION QUALITY CONTROL REPORT	DATE	REPORT NUMBER
CONTRACT NUMBER/PROJECT NUMBER	**DESCRIPTION AND LOCATION OF WORK:**	
WEATHER COMMENTS:		
CONTRACTORS/SUBCONTRACTORS AND AREA OF RESPONSIBILITY FOR WORK PERFORMED TODAY: (Indicate start & stop times for each.) **A.** **B.** **C.** **D.** **E.**		
1. WORK PERFORMED TODAY: (Indicate location and description of work performed. Refer to work performed by prime and/or subcontractor by letter in table above.)		
2. TYPE AND RESULTS OF INSPECTION: (Indicate whether P-Preparatory, I-Initial, or F-Follow-up and include satisfactory work completed or deficiencies with action to be taken.)		
3. TESTS REQUIRED BY PLANS AND/OR SPECIFICATIONS PERFORMED AND RESULTS OF TESTS: (Comment on test(s) & attach test reports.)		
4. MATERIALS RECEIVED/INSTALLED: (Acceptability of incoming materials; list all materials installed; location of stored materials.)		
5. VERBAL INSTRUCTIONS RECEIVED: (List any instructions given by Government personnel on construction deficiencies, testing required, etc. with action to be taken.)		
6. REMARKS: (Cover any conflicts in plans, specifications or instructions; offsite surveillance activities; progress of work, delays, causes and extent thereof; environmental considerations; comments on change orders, etc.)		

7. SAFETY:	(Include any infractions of approved safety plan, safety manual, or instruction from Government personnel. Specify corrective action taken.

CONTRACTOR'S CERTIFICATION:

I certify that the above report is complete and correct and that all material and equipment used, work performed and tests conducted during this reporting period were in strict compliance with the contract plans and specifications except as noted above.

CONTRACTOR'S AUTHORIZED REPRESENTATIVE

GOV'T QA Review & Comments (see below)

Gov't Site Visit ? YES NO Time of visit _____ to _____Hours

Additional Comments:

QA Comments & Review Only:

Signed: _____ Date: _____

(Sample of Typical Contractor's Test Report)

TEST REPORT

STRUCTURE OR
BUILDING_____

CONTRACT
NO._____

DESCRIPTION OF ITEM, SYSTEM, OR PART OF SYSTEM TESTED:_____
_____
_____

DESCRIPTION OF
TEST:_____
_____
_____

NAME AND TITLE OF PERSON IN CHARGE OF PERFORMING TESTS FOR THE CONTRACTOR:

NAME:_____

TITLE:_____

SIGNATURE:_____

I HEREBY CERTIFY THAT THE ABOVE DESCRIBED ITEM, SYSTEM OR PART OF SYSTEM HAS BEEN TESTED AS INDICATED ABOVE AND FOUND TO BE ENTIRELY SATISFACTORY AS REQUIRED IN THE CONTRACT SPECIFICATIONS.

SIGNATURE OF
CONTRACTOR:_____

QUALITY CONTROLLER
(QC):_____

DATE:_____

REMARKS:
_____
_____
_____
_____

END OF SECTION

FAIRCHILD BASE DESIGN STANDARDS

DATA SHEET

8 Feb 2000

DIVISION 1

SECTION 01500 - TEMPORARY FACILITIES

A. When developing specifications for this section, use the standard Fairchild Air Force Base specifications developed by the 92d Civil Engineer Squadron Engineering Flight and edit for the specific project. This standard specification incorporates construction/site management standards included as an attachment to HQ AMC/CE letter dated 20 Nov 97, subject: Construction/Site Management Standards for Construction on AMC Installations. See attached specification for example.

B. Traffic Routes, Project Limits, and Storage Areas

1. Traffic Routes: Show contractor haul/access routes on project drawings no later than the 35% design submittal. Access route selection should avoid high visibility areas, consider security restrictions, and take into account the nature of the work (eg., hauling demolition materials, concrete delivery, etc.).

2. Project Limits: Show project limit lines on project drawings no later than the 35% submittal. Project limit lines must encompass utility corridors as well as general construction areas. Project work area and contractor lay-down area are to be enclosed with a 6-foot high chain link fence with brown, UV light resistant, plastic fabric mesh netting (similar to tennis court or other screening) and gates. Strive to limit project limits/contractor lay-down area(s) to those essential for completion of the work. Contractor's lay-down area is intended to be for materials needed within one week. Prior to starting work, the contractor must submit site plans for approval showing the layout and details of all temporary facilities used for the contract. The plan shall include the location of the safety and construction fences, location of all site trailers, equipment and material storage areas, construction entrances, trash dumpsters, temporary sanitary facilities, and worker parking areas.

3. Storage Areas: Show 'approved' storage area(s) on project drawings no later than the 35% submittal. Approval must be obtained in writing from 92 CES/CEC for all storage areas. Storage area(s) must be limited to a specific size and fenced as described above. Ensure Specification Section 01500 clearly identifies whether or not a storage area is provided.

4. Fencing: Fairchild won't allow orange construction fencing, therefore, the standard specification requires chain link fencing.

5. Contractor shall be responsible for keeping project areas, including storage/staging and office areas, clean and free of weeds and uncontrolled vegetation growth. All loose debris and material subject to being moved by prevailing winds in the area shallbe picked up or secured at all times. Contractor's plan for controlling dirt, debris, and dust on base roadways is a submittal item. As a

minimum, the plan shall identify the subcontractor and equipment for cleaning along haul routes and measures to reduce dirt, dust, and debris from roadways.

Special Rules for Housing Areas: Storage areas are not permitted at the entrances to housing areas. If the project does not lend itself to 'just-in-time' delivery or storage 'down town' by the contractor, an on- or near-base storage area, to be determined by the Government, may be authorized; approval must be obtained in writing by 92 CES/CEC.

END OF SECTION

SECTION 01500 - TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security and protection. A visually acceptable site at Fairchild Air Force Base is an important construction standard. A clean, well-kept site will help ensure compliance with the safety and environmental requirements of the contract. The contractor shall maintain the trailers/storage buildings in good and clean, condition or must remove them. The contractor is responsible for the security of his property and general housekeeping of the area(s). NOTE: Contractor storage sheds/trailers need not comply with base standard colors, however, trailers shall be skirted, with skirting color to match body color.

B. Temporary construction and support facilities required include but are not limited to:

1. Field offices and storage sheds.

2. Temporary roads and paving.

3. Temporary project identification signs and bulletin boards.

4. Temporary enclosures and fences.

5. Sanitary facilities.

6. Waste disposal services.

7. Construction aids and miscellaneous services and facilities.

C. Security and facility protection required include but are not limited to:

1. Temporary fire protection.

2. Barricades, warning signs, and lights.

3. Sidewalk bridge or enclosure fence for the site.

4. Environmental protection.

1.03 QUALITY CONTROL

A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to:

1. Building Code requirements.

2. Health and safety regulations.

3. Utility company regulations.

4. Police, Fire Department and Rescue Squad rules.

B. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library, "Temporary Electrical Facilities."

1. Refer to "Guidelines for Bid Conditions for industry recommendations.

C. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electrical Code (NFPA 70).

D. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.04 PROJECT CONDITIONS

A. Conditions of Use:

1. Temporary services, facilities, storage areas, and all other job site areas shall be kept clean and neat in appearance at all times. Materials shall be neatly stacked until ready for use. All materials, supplies, equipment, etc. that are no longer needed shall be promptly removed from the site.

2. Job site, storage/staging, and office areas shall be kept free of weeds and uncontrolled vegetation growth at all times. Cut dryland grass within the construction and storage sites to a 4-inch (100 mm) height at least once per week during the growing season. Improved grounds/lawn areas shall be mowed at least once per week during the growing season to keep growth to less than (2) inches (50 mm). Trim the grassinside and at least

24 inches outside project fences at time of grass cutting. Grass or weeds on stockpiled earth shall be maintained as described above.

3. Areas of improved grounds within the project limits that are scheduled to remain after construction shall be maintained during construction by the contractor. Maintenance shall include watering, mowing, and trimming. Irrigation shall be provided as necessary to maintain grass in a healthy growing condition.

4. All loose debris and material subject to being moved by prevailing winds in the area shall be picked up or secured at all times.

5. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities. Do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on the site

B. Maintain in good condition throughout the job all temporary and existing utilities required for construction.

C. Terminate use and remove temporary utilities at earliest reasonable time when no longer needed or when permanent utilities have, with authorized use, replaced the need.

1.05 TEMPORARY ELECTRICITY AND LIGHTING

A. Provide connections to existing facilities, size to provide service required for power and lighting; Government will pay the costs of power used when the contractor connects to Government owned electrical lines.

B. Install circuit and branch wiring with area distribution boxes located so that power and lighting is available throughout the construction site by the use of construction-type power cords.

C. Provide adequate artificial lighting for all areas of work when natural light is not adequate for work and for areas accessible to the public.

D. Permanent electrical service installed under this contract may be used during construction period.

1.06 TEMPORARY HEAT AND VENTILATION

A. Provide temporary heat and ventilation as required to maintain adequate environmental conditions to facilitate progress of the work, to meet specified minimum conditions for the installation of materials, and to protect materials and finishes from damage due to the temperature or humidity.

B. Provide adequate forced ventilation of enclosed areas for accumulation of duct, fumes, vapors, or gases.

C. Portable heaters shall be standard approved units complete with controls, of a type which will not smoke or otherwise damage building finishes. Pay all costs of installation, maintenance, operation, and removal.

D. Provide connections to existing facilities; extend and supplement with temporary units as required to comply with requirements. Pay all costs of installation, maintenance, operation and removal. Government will pay costs of fuel used from the existing system.

1.07 TEMPORARY WATER

A. Make connections to existing facilities to provide water for construction purposes. Government will supply reasonable amounts of water at no cost to the Contractor. Contractor shall pay all costs of installation (including materials), maintenance, operation, and removal of the connections.

1.08 SUBMITTALS

A. Site Plan: Prior to starting the work, submit site plan(s) to the Contracting Officer for approval showing the layout and details of all temporary facilities used for this contract. The plan shall include the location of the safety and construction fences, location of all site trailers, equipment and material storage areas, construction entrances, trash dumpsters, temporary sanitary facilities, and worker parking areas. Site photographs prior to the start of work may be included with the plan. At completion of work, the contractor shall remove the facilities and restore the site(s) to original condition.

B. Dirt and Dust Control Plan: Submit truck and material haul routes along with a plan for controlling dirt, debris, and dust on base roadways. As a minimum, the plan shall identify the subcontractor and equipment for cleaning along the haul route and measures to reduce dirt, dust, and debris from roadways.

PART 2 – PRODUCTS

2.01 MATERIALS

A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if acceptable to the Government (refer to Section 01600, MATERIALS & EQUIPMENT). Provide materials suitable for the use intended.

B. Construction and Safety Fence: Provide galvanized chain link fencing 2m (6 foot) high, with brown, UV light resistant, plastic fabric mesh netting (similar to tennis court screening), and galvanized steel posts and gates..

2.02 EQUIPMENT

A. General: Provide new equipment. Undamaged, previously used equipment in serviceable condition may be used if acceptable to the Government (refer to Section 01600, MATERIALS & EQUIPMENT). Provide equipment suitable for use intended.

B. Electrical Outlets: Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.

C. Electrical Power Cords: Provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.

D. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.

E. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the type of fuel being consumed.

F. Administrative Field Office(s) and Material Storage Trailers: Contractor' s administrative field office(s) and material storage trailers shall be in like-new condition. Locate the office(s) and trailers behind the construction fence unless otherwise indicated on the drawings. Storage of materials/debris under field offices or trailers is prohibited.

G. Dumpsters: Use only dumpsters painted to match Sherwin-Williams paint color #SW 2070, "Spanish Moss." Equip dumpsters with a secure cover. The cover shall be closed at all times, except when being loaded with trash and debris. Locate dumpsters behind the construction fence/contractor lay-down area. Empty site dumpsters at least once a week, or as needed to keep the site free of debris and trash. If necessary, provide 208 liter (55 gallon) trash containers to collect debris in the construction site area. Locate the trash containers behind the construction fence or out of the public view. Empty trash containers at least once a day. Large demolition normally requires a large dumpster without lids—these are acceptable but shall be located within the construction fence and shall not have debris higher than the sides before emptying.

H. Temporary Telephones: Provide temporary telephone service for all supervisory personnel engaged in construction activities (i.e., superintendent and QC), throughout the construction period.

I. Temporary Sanitation Facilities: All temporary sewer and sanitation facilities shall be self contained units with both urinals and stool capabilities. Ventilate the units to control odors and fumes and empty and clean them at least once a week or more often if required by the contracting officer. The doors shall be self-closing.. Locate the facilities behind the construction fence/contractor lay-down area.

J. First Aid Supplies: Comply with governing regulations.

K. Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.01 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

A. Use qualified personnel for installation of temporary facilities. Comply with applicable requirements if specified in Division 15-Mechanical and in Division 16- Electrical. Maintain and operate systems to assure continuous service. Modify and extend systems as work progress requires.

B. Locate field offices, storage sheds, sanitary facilities and other temporary construction and support facilities for easy access, confined to the area(s) designated on the drawing. Enclose the project work area/contractor lay-down area with 2m (6 foot) high chain link fence with brown, UV light resistant, plastic fabric mesh netting and gates. Contractor' s lay-down area is intended to be for materials needed within one week. Remove the fence upon completion and acceptance of the work. The intent is to block the construction from public view.

C. Maintain temporary construction and support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion may be permitted to use permanent facilities, under conditions acceptable to the Government.

D. Temporary Enclosures: Provide temporary enclosures for protection of construction from exposure to foul weather, other construction operations, and similar activities.

1. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.

2. Close openings through floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.

3. Where temporary wood or plywood enclosure exceeds 100 sq. ft. (9.2 sq. m) in area, use UL-labeled, fire-retardant-treated material for framing and main sheathing.

E. Collection and Disposal of Waste: Collect waste generated from construction daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.

3.03 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Temporary Fire Protection: Provide and maintain temporary fire protection facilities of the types needed to protect against reasonable predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations." Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher in each building.

B. Store combustible materials in containers in fire-safe locations.

C. Maintain unobstructed access to fire extinguishers, fire hydrants, and access routes for fighting fires. Prohibit smoking in all areas.

3.04 OPERATION, TERMINATION AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Termination and Removal: Unless the Government requires that it be maintained longer, remove each temporary facility when the need has ended, but no later than Substantial Completion. Restore existing facilities used for temporary services as specified, or to original condition. At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:

1. Replace air filters and clean inside of ductwork and housings.

2. Replace significantly worn parts and parts that have been subject to unusual operating conditions.

3. Replace lamps that are burned out or noticeably dimmed by substantial hours of use.

4. Clean and repair damage caused by temporary installations or use of temporary facilities; replace construction that cannot be satisfactorily repaired.

END OF SECTION

DIVISION 1

SECTION 01600 - MATERIALS AND EQUIPMENT

A. When developing specifications for this section, use the standard Fairchild Air Force Base specifications developed by the 92d Civil Engineer Squadron Engineering Flight and edit for the specific project. See attached specification for example.

B. Recycled Products: Refer to Division 0, Section 00003, Environmental. Also refer to Fairchild's "Affirmative Procurement Plan", with which compliance is mandatory by presidential order.

END OF SECTION

SECTION 01600 - MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes administrative and procedural requirements governing the Contractor's selection of products for use in the Project.

1. Multiple Prime Contracts: Provisions of this Section apply to the construction activities of each prime contractor.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Submittals" specifies requirements for submittal of the Contractor's Construction Schedule and the Submittal Schedule.

1.03 DEFINITIONS

A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.

1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

a. "Named Products" are items identified by the manufacturer's product name, including make or model number or other designation, shown or listed in the manufacturer's published product literature, that is current as of the date of the Contract Documents.

b. "Foreign Products," as distinguished from "domestic products," are items substantially manufactured (50 percent or more of value) outside the United States and its possessions. Products produced or supplied by entities substantially owned (more than 50 percent) by persons who are not citizens of, nor living within, the United States and its possessions are also considered to be foreign products.

2. "Materials" are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

3. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

1.04 QUALITY ASSURANCE

A. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.

1. When specified products are available only from sources that do not, or cannot, produce a quantity adequate to complete project requirements in a timely manner, consult with the Government to determine the most important product qualities before proceeding. Qualities may include attributes, such as visual appearance, strength, durability, or compatibility. When a determination has been made, select products from sources producing products that possess these qualities, to the fullest extent possible.

B. Compatibility of Options: When the Contractor is given the option of selecting between 2 or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.

1. Each prime contractor is responsible for providing products and construction methods that are compatible with products and construction methods of other prime or separate contractors.

2. If a dispute arises between prime contractors over concurrently selectable, but incompatible products, the Government will determine which products shall be retained and which are incompatible and must be replaced.

C. Foreign Product Limitations: Except under one or more of the following conditions, provide domestic products, not foreign products, for inclusion in the Work:

1. No available domestic product complies with the Contract Documents.

2. Domestic products that comply with the Contract Documents are available only at prices or terms substantially higher than foreign products that comply with the Contract Documents.

D. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on accessible surfaces that are not conspicuous.

2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:

    a. Name of product and manufacturer.
    b. Model and serial number.
    c. Capacity.
    d. Speed.
    e. Ratings.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.

    1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.

    2. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

    3. Deliver products to the site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.

    4. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

    5. Store products at the site in a manner that will facilitate inspection andmeasurement of quantity or counting of units.

    6. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.

    7. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2 - PRODUCTS

2.01 PRODUCT SELECTION

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, new at the time of installation.

1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and the intended use and effect.

2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

B. Product Selection Procedures: The Contract Documents and governing regulations govern product selection. Procedures governing product selection include the following:

1. Proprietary Specification Requirements: Where Specifications name only a single product or manufacturer, provide the product indicated. No substitutions will be permitted.

2. Semiproprietary Specification Requirements: Where Specifications name 2 or more products or manufacturers, provide 1 of the products indicated. No substitutions will be permitted.

a. Where Specifications specify products or manufacturers by name, accompanied by the term "or equal" or "or approved equal," comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

3. Nonproprietary Specifications: When Specifications list products or manufacturers that are available and may be incorporated in the Work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with Contract requirements. Comply with Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

4. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.

5. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements and are recommended by the manufacturer for the application indicated.

a. Manufacturer's recommendations may be contained in published product literature or by the manufacturer's certification of performance.

6. Compliance with Standards, Codes, and Regulations: Where Specifications only require compliance with an imposed code, standard, or regulation, select a product that complies with the standards, codes, or regulations specified.

7. Visual Matching: Where Specifications require matching an established Sample, the Government's decision will be final on whether a proposed product matches satisfactorily.

    a. Where no product available within the specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract Documents concerning "substitutions" for selection of a matching product in another product category.

8. Visual Selection: Where specified product requirements include the phrase "... as selected from manufacturer's standard colors, patterns, textures ..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Government will select the color, pattern, and texture from the product line selected.

9. Recycled Products: In an effort to promote energy savings and global use of renewable resources, the Government is endorsing the recycled-products market. It encourages the use of post-consumer "raw" materials and other recycled products as a basis for its building construction. In Section 6002 of the Resource Conservation and Recovery Act (RCRA), Congress directed the Federal Government to promote recycling. The Environmental Protection Agency was tasked to designate products that can be made with recovered materials and to recommend practices for buying these products. Executive Order 12873, dated October 20, 1993, called for the increase in the Federal Government's use of recycled content products. The Air Force is requiring the use of products containing recycled materials, when available. As such, using the EPA' s Recovered Material Advisory Notice (RMAN) and the Comprehensive Procurement Guideline (CPG), effective May 1996, the Air Force is actively promoting it' s desire to buy recycled construction products. Fairchild AFB has adopted the " Affirmative Procurement Plan" dated August 1999 for site-specific guidance. In order to ensure quality, it is required that the contractor submit specific information regarding such materials. The EPA' s recommended content levels are mandatory for AF purchasers. These specific products and their content levels shall be called for and so designated in the appropriate Division(s) and Section(s) of the Specification. It is mandatory that the contractor submit specific product descriptions and quantities for these materials. Included for each material shall be the following: description of item, place of origin, manufacturer, contract reference or type of submittal, unit of measurement, quantity, and value. This information shall be submitted formally on AF Form 66, Schedule of Material Submittals. The Government seeks your partnership in providing these materials as specified. If you are unable to do so, because of one of the following criteria, then you will need to provide written documentation explaining why you were not able to do so.

When may the contractor choose not to provide an item containing recovered materials? If the material is not available within a reasonable period of time (resulting in unreasonable delays to the project) or, is not available from sufficient number of sources to maintain a satisfactory level of competition or, does not meet specified performance standards or,is only available at an unreasonable price, (it is more expensive than a similar non-recycled content item) or, if it can be shown the item may expose employees to and undue hazard.

Such materials shall be evaluated, and approved or disapproved by the Government on a similar basis as a product substitution. In the opinion of the Government, if the material does not meet the intent of the specification, it shall be basis for disapproval. The contractor shall submit estimates of value, and certifications (see attached form) verifying recycled content(s) of materials utilized in the performance of this construction contract. This information is necessary to enable the Air Force to ensure that they are fulfilling their requirements to purchase items composed of recovered materials.

PART 3 - EXECUTION

3.01 INSTALLATION OF PRODUCTS

A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.

1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION

RECOVERED MATERIALS DETERMINATION FORM

Instructions

This form is to be completed by the Contractor when EPA-designated items included in the Affirmative Procurement Program for Recovered Materials are being procured from outside vendors. For questions on whether the product counts as "EPA designated" or what the required recycled content is, refer to product descriptions on EPA's website at http://www.epa.gov/cpg.

1. The Contractor shall list which item(s) apply to the procurement request, the required recycled content, the actual recycled content, and sign and date the following Certification.

2. If an exemption is being claimed, the Contractor shall also sign the Certification.

3. The completed form shall be submitted to the Contracting Officer and shall become part of the contract file.

AFFIRMATIVE PROCUREMENT CERTIFICATION

Project No./Contract No._____

Complete Part **A** or Part **B,** as appropriate:

****

A. I hereby certify the Contract Specifications for the requisition of all materials listed on this form complies with EPA standards for recycled/recovered materials content.

Contractor' s Signature _____ Date _____
Contractor' s Title and Company
_____

Below is a matrix listing format of the EPA designated recycled content items. Complete the matrix format by placing information in the box beside each applicable item on the matrix.

Comprehensive Procurement Guidelines - Categories and Designated Items **(Note: This table includes proposed CPG items as well as items designated final.)** Please place information in **all** appropriate boxes.	Specification Section No.	Percent recycled content	Manufacturer: Name & Address	Approximate Value for this Contract
VEHICULAR PRODUCTS				
Engine coolants - antifreeze				
Re-refined lubricating oils - including motor oil				
Retread tires				
CONSTRUCTION PRODUCTS				
Building insulation products				
Carpet backing				
Carpet cushion				
Polyester carpet				
Cement and concrete				
Latex paint				
Floor tiles				

Laminated paperboard				
Patio blocks				
Shower and restroom dividers and partitions				
Structural fiberboard				
Flowable fill				
Railroad grade crossings/ surfaces				
LANDSCAPING PRODUCTS				
Food waste compost				
Yard trimmings compost				
Landscape timbers and posts				
Garden and soaker hoses				
Hydraulic mulch				
Lawn and garden edging				
NON-PAPER OFFICE PRODUCTS				
Plastic binders				
Plastic clipboards				
Plastic clip portfolios				
Plastic file folders				
Plastic presentation folders				
Binders (paper, plastic covered)				
Office recycling containers				
Office waste receptacles				
Plastic desktop accessories				
Plastic envelopes				
Plastic trash bags				
Printer ribbons				
Toner cartridges				
PAPER AND PAPER PRODUCTS				
Printing and writing papers				
Newsprint				
Sanitary tissue				
Paperboard				
Packaging				
PARK and RECREATION PRODUCTS				
Playground equipment				
Park and recreational furniture				

Plastic fencing				
Playground surfaces				
Running tracks				
TRANSPORTATION PRODUCTS				
Channelizers				
Flexible delineators				
Parking stops				
Traffic barricades				
Traffic cones				
Delineators				
MISCELLANEOUS PRODUCTS				
Pallets				
Sorbents				
Awards and plaques				
Industrial drums				
Mats				
Signage				
Strapping and stretch wrap				

****

B. The following item does not comply with EPA standards for recycled/recovered materials. A written determination for each noncompliant purchase over $2500 is required. *(please complete a separate justification for each noncompliant item purchased as part of this procurement action):*
The exemption being claimed for this purchase is:

_____The product does not meet technical or performance standards.

_____The product is not available within a reasonable time frame.

_____The product is not available competitively (from two or more sources).

_____The product is only available at an unreasonable price (it costs more than a comparable non-recycled-content product). The recycled-content product costs $_____ per_____ and the non-recycled-content product costs $_____per_____.

Contractor’ s Signature _____Date _____
Contractor’ s Title and Company
_____

LGC Commander _____Date _____

(End of Clause)

DIVISION 1

SECTION 01631 - PRODUCT SUBSTITUTIONS

A. When developing specifications for this section, use the standard Fairchild Air Force Base specifications developed by the 92d Civil Engineer Squadron Engineering Flight and edit for the specific project. See attached specification for example.

END OF SECTION

SECTION 01631 - PRODUCT SUBSTITUTIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements for handling requests for substitutions made after award of the Contract.

B. The Contractor's Construction Schedule and the Schedule of Submittals are included under Section "Submittals."

1.03 DEFINITIONS

A. Definitions used in this Article are not intended to change or modify the meaning of other terms used in the Contract Documents.

B. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the Contractor after award of the Contract are considered requests for "substitutions." The following are not considered substitutions:

1. Substitutions requested by Bidders during the bidding period, and accepted prior to award of Contract, are considered as included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.

2. Revisions to Contract Documents requested by the Government.

3. Specified options of products and construction methods included in Contract Documents.

4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

1.04 SUBMITTALS

A. Substitution Request Submittal: Requests for substitution will be considered if received within 15 days after commencement of the Work. Requests received more than 15 days after commencement of the Work may be considered or rejected at the discretion of the Government.

1. Submit each request for substitution in accordance with Submittal procedures.

2. Identify the product, or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:

a. Product Data, including Drawings and descriptions of products, fabrication and installation procedures.

b. Samples, where applicable or requested.

c. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as size, weight, durability, performance and visual effect.

d. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Government and separate Contractors, that will become necessary to accommodate the proposed substitution.

e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution.

f. Indicate the effect of the proposed substitution on overall Contract Time.

g. Cost information, including a proposal of the net change, if any in the Contract Sum.

h. Certification by the Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the Contractor's waiver of rights to additional payment or time, that may subsequently become necessary because of the failure of the substitution to perform adequately.

PART 2 - PRODUCTS

2.01 SUBSTITUTIONS

A. Conditions: The Contractor's substitution request will be received and considered by the Government when one or more of the following conditions are satisfied, as determined by the Government; otherwise requests will be returned without action except to record noncompliance with these requirements. Extensive revisions to Contract Documents are not required.

1. Proposed changes are in keeping with the general intent of Contract Documents.

2. The request is timely, fully documented and properly submitted.

3. The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.

4. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.

5. A substantial advantage is offered the Government, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Government may be required to bear.

6. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.

7. The specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.

8. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provide the required warranty.

9. The Contractor's submittal and Government's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

DIVISION 1

SECTION 01700 - CONTRACT CLOSEOUT

A. When developing specifications for this section, use the standard Fairchild Air Force Base specifications developed by the 92d Civil Engineer Squadron Engineering Flight and edit for the specific project. See attached specification for example.

B. Inspection procedures vary for housing and phased projects; designers must select the appropriate inspection procedures for the specific type of contract.

C. Designers must also ensure that Fairchild Standard Specification Sections 1701, O&M Manuals; 1702, As-Built Records and Drawings; and 1704, Warranties are also included in their project specifications.

END OF SECTION

SECTION 01700 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout including, but not limited to, the following:

1. Inspection procedures.

2. Project record document submittal.

3. Operation and maintenance manual submittal.

4. Submittal of warranties.

5. Final cleaning.

B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 16.

1.03 SUBSTANTIAL COMPLETION

A. General: Contractor shall provide notification to Government when all work begins and ends in each unit. Government inspections shall occur throughout the entire period of work with one date of Substantial Completion for the entire project.

B. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete.

a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.

b. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.

2. Advise the Government of pending insurance changeover requirements.

3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.

4. Obtain and submit releases enabling the Government unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

5. Submit record drawings, maintenance manuals, final project photographs, damage or settlement surveys, property surveys, and similar final record information.

6. Deliver tools, spare parts, extra stock, and similar items.

7. Make final changeover of permanent locks and transmit keys to the Government. Advise the Government's personnel of changeover in security provisions.

8. Complete startup testing of systems and instruction of the Government's operation and maintenance personnel. Discontinue and remove temporary facilities from the site, along with mockups, construction tools, and similar elements.

9. Complete final cleanup requirements, including touchup painting.

10. Touch up and otherwise repair and restore marred, exposed finishes.

C. Inspection Procedures: On receipt of a request for inspection, the Government will either proceed with inspection or advise the Contractor of unfilled requirements. The Government will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

1. The Government will repeat inspection when requested and assured that the Work is substantially complete.

2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.04 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.

2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.

3. Submit a certified copy of the Government's final inspection list of items to be completed or corrected, endorsed and dated by the Government. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the Government.

4. Submit consent of surety to final payment.

5. Submit a final liquidated damages settlement statement.

6. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Reinspection Procedure: The Government will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the Government.

1. Upon completion of reinspection, the Government will prepare a certificate of final acceptance. If the Work is incomplete, the Government will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

2. If necessary, reinspection will be repeated.

1.05 RECORD DOCUMENT SUBMITTALS

A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the Government 's reference during normal working hours.

B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give

particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.

2. Mark new information that is important to the Government but was not shown on Contract Drawings or Shop Drawings.

3. Note related change-order numbers where applicable.

4. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.

C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda. Include with the Project Manual one copy of other written construction documents, such as Change Orders and modifications issued in printed form during construction.

1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.

2. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.

3. Note related record drawing information and Product Data.

4. Upon completion of the Work, submit record Specifications to the Government for the Government's records.

D. Record Product Data: Maintain one copy of each Product Data submittal. Note related Change Orders and markup of record drawings and Specifications.

1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site and from the manufacturer's installation instructions and recommendations.

2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.

3. Upon completion of markup, submit complete set of record Product Data to the Government for the Government's records.

E. Record Sample Submitted: Immediately prior to Substantial Completion, the Contractor shall meet with the Contracting Officer and the Government's personnel at the Project Site to

determine which Samples are to be transmitted to the Government for record purposes. Comply with the Government's instructions regarding delivery to the Government's Sample storage area.

F. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to the Government for the Government's records.

G. Maintenance Manuals: Organize operation and maintenance data into suitable sets of manageable size as indicated in General Requirements Section 01701 "Operations and Maintenance Manuals."

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 CLOSEOUT PROCEDURES

A. Operation and Maintenance Instructions: Arrange for each Installer of equipment that requires regular maintenance to meet with the Government's personnel to provide instruction in proper operation and maintenance. Provide instruction by manufacturer's representatives if installers are not experienced in operation and maintenance procedures. Include a detailed review of the following items:

MODIFY LIST BELOW TO SUIT PROJECT.

1. Maintenance manuals.
2. Record documents.
3. Spare parts and materials.
4. Tools.
5. Lubricants.
6. Fuels.
7. Identification systems.
8. Control sequences.
9. Hazards.
10. Cleaning.
11. Warranties and bonds.
12. Maintenance agreements and similar continuing commitments.

B. As part of instruction for operating equipment, demonstrate the following procedures:

1. Startup.
2. Shutdown.
3. Emergency operations.
4. Noise and vibration adjustments.
5. Safety procedures.
6. Economy and efficiency adjustments.
7. Effective energy utilization.

C. Also provide the Government's personnel with instructions for operating and maintaining equipment recorded on VHS-format video-tape.

3.02 FINAL CLEANING

A. General: The General Conditions require general cleaning during construction. Regular site cleaning is included in Division 1 Section "Construction Facilities and Temporary Controls."

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion.

a. Remove labels that are not permanent labels.

b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.

c. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.

d. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.

e. Clean the site, including landscape development areas, of rubbish, litter, and other foreign substances. Sweep paved areas broom clean; remove stains, spills, and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth, even-textured surface.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid the Project of rodents, insects, and other pests.

D. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.

E. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Government's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the site and dispose of lawfully.

1. Where extra materials of value remain after completion of associated Work, they become the Government's property. Dispose of these materials as directed by the Government.

END OF SECTION

DIVISION 1

SECTION 01701 – OPERATIONS & MAINTENANCE MANUALS

A. When developing specifications for this section, use the standard Fairchild Air Force Base specifications developed by the 92d Civil Engineer Squadron Engineering Flight and edit for the specific project. See attached specification for example.

END OF SECTION

SECTION 01701 - OPERATION AND MAINTENANCE MANUALS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements for Operations and Maintenance Manuals including information on, but not limited to the following:

1. Contractor furnished and installed equipment.

2. Contractor furnished and installed systems and materials.

3. Government furnished-Contractor installed equipment.

4. Government furnished-Contractor installed systems and materials.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Submittals" for submitting the Contractor's Construction Schedule and Submittal Register.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 GENERAL

A. The Contractor shall provide Operation and Maintenance (O&M) manuals for the complete project as applicable under this contract, including all Contractor furnished and installed equipment, systems and materials, and all Government furnished-Contractor installed equipment, systems and materials. Included herein are requirements for compiling and submitting the O&M data. Additional O&M data requirements are specified in the individual sections of the technical specifications. O&M Manual requirements shall be coordinated with

the requirements as stated in the other technical specification sections and shall include listings for spare parts, framed instructions, etc.

3.02 FORMAT

A. O&M data shall be separated into distinct systems. O&M manuals for any particular system shall include narrative and technical descriptions of the interrelations with other systems. This narrative shall include a description on how the system works with notable features of the system, including normal and abnormal operating conditions. The explanation of the system is to be short and concise with reference to specific manufacturer's equipment manuals for details (see paragraph CONTENT, subparagraph b). If the quantity of material is such that it will not fit within one binder then it shall be divided into volumes, as required (see paragraph in Binders). Four copies of the manuals are required for the complete project. The requirement for four copies of the O&M manual shall supersede and replace any requirements for a lesser amount of manuals which may be indicated in some specifications. Each set of manuals shall be tailored for its respective building or facility.

B. O&M manuals shall be prepared for each individual facility of multi-facility projects. For those project where the work performed is identical in each building, separate O&M manuals are required for each building.

C. Four (4) complete bound copies of the final O&M data as approved by Contracting Officer for each building or facility shall be required. The requirement for four copies of the O&M manual shall supersede and replace any requirements for a lesser amount of manuals which may be indicated in some specifications. Each set of manuals shall be tailored for its respective building or facility.

3.03 PRELIMINARY O&M MANUAL AND DATA SUBMITTAL

A. To establish and assure uniform O&M manual format, the Contractor shall submit and receive Contracting Officer approval on two (2) complete sets of preliminary O&M data, one with original manufacturer's literature. This preliminary submittal for each set of O&M data, without binder(s), shall also include two typewritten pages representing the proposed binder marking format as required under Paragraph Marking and Binding. One page(s) will represent the front cover(s) and the other page(s) will represent the spine(s).

B. Data submitted for each manual shall only be for the specific equipment furnished. All data shall be in addition to that furnished as shop drawings and construction submittals.

C. The Contracting Officer may require up to thirty (30) days for review of submitted O&M manual(s) or data, therefore the contractor shall submit O&M manuals in sufficient time to allow for government review prior to training. The Contracting Officer will retain the copy of submitted O&M manual(s) and return the one containing the original manufacturer's literature. The returned submittal will be marked either "Approved" or "Disapproved - see

remarks". If "Disapproved" the Contractor shall resubmit the required number of copies of the manual(s) incorporating all previous comments until an "Approved" submittal is received.

D. For equipment or systems requiring personnel training and/or acceptance testing, the final O&M data must be approved by the Contracting Officer prior to the scheduling of training and/or testing. O&M data on equipment or systems not requiring training or testing shall be submitted so all data will be approved and bound in the O&M manuals in the required quantity by the time the project reaches 90 percent completion. Failure to furnish approved, bound manuals in the required quantity by the time the project is 90 percent complete, will be cause for the Contracting Officer to hold or adjust the retained percentage in accordance with CONTRACT CLAUSE, PAYMENTS UNDER FIXED PRICE CONSTRUCTION CONTRACTS.

E. All three copies of the final O&M manuals shall contain original manufacturer's data and product literature. All data furnished must be of such quality to reproduce clear, legible copies. Holes used to bind data shall not be punched through text, and all text shall be readable when bound.

3.04 BINDERS

A. Construction and Assembly

1. Construction: Manuals shall be sliding posts or screw-type aluminum binding posts (three screws) with spine, but only one type shall be used for all manuals. The manuals shall be hardback covered, cleanable, and not over three (3) inches thick and designed for 8- 1/2 x 11 inch paper. The hard cover shall be of minimum stiffness equal to 0.080 inch display board or double weight illustration board.

2. Marking: Each binder shall have the following information inscribed on the cover using an offset of silk screen printing process: Type of O&M Manual, Project Title, Project Number, Facility Number, Volume Number, and Prime Contractor, (see Figure 1. O&M Manual Cover). Each binder shall also have the following information inscribed on the spine in the same manner as above: Type of O&M Manual, Project Title, Project Number, Facility Number, Volume Number and Year Constructed (see Figure 2. O&M Manual Spine).

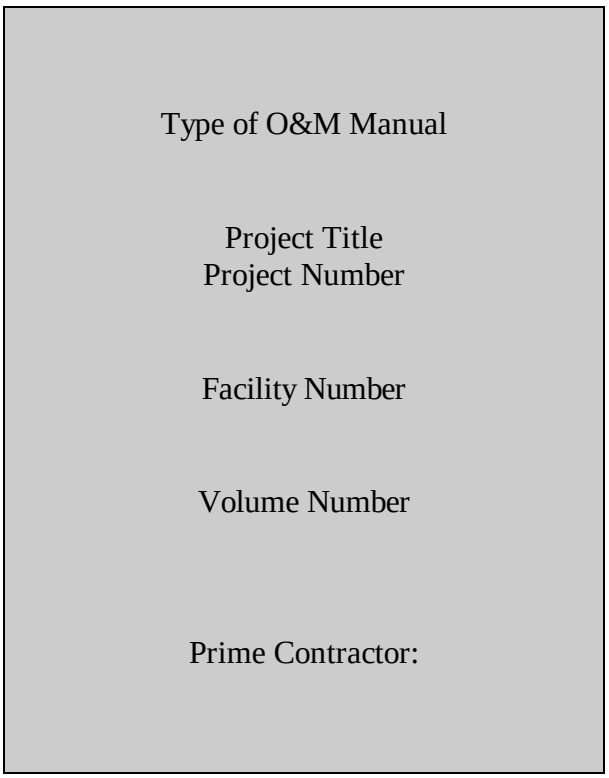


Figure 1. O&M Manual Cover

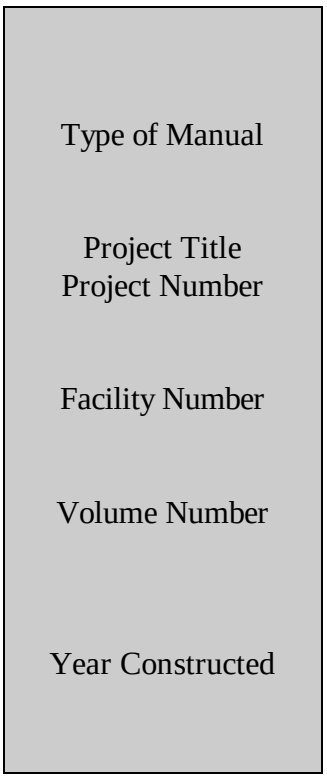


Figure 2. O&M Manual Spine

3. Color: Color of binder shall be black and printing shall be gold.

4. Contents

   a. Mechanical, Electrical, Fire Protection and Detection, Security, and Irrigation O&M Manuals shall be structured to address each of the following topics in the order listed.

      (1) Warning Page: A warning page shall be provided to warn of potential dangers (if they exist), such as high voltage, toxic chemicals, flammable liquids, explosive materials, carcinogens, or high pressures. The warning page shall be placed inside the front cover, in front of the title page.

      (2) Title Page: A title page shall be provided to include prime contractor name, telephone number, and address. Title page shall also include project tile, project number, contract number, warranty inclusion dates and list of all subcontractors with addresses and phone numbers.

      (3) Index: Each manual shall have a master index at the front identifying all manuals, volumes and subject matter for each volume. Following the master index, each manual shall have an index of its enclosures listing each section by CSI format and product/equipment name. Rigid tabbed fly leaf sheets shall be provided for each

separate product, equipment or system within the manual. For example, if a project has Air Handling Units 1 through 4, there shall be tab sheets:

15500	15500	15500	15500
AHU-1	AHU-2	AHU-3	AHU-4

(4) Description: Narrative and technical descriptions of the system and of the interrelations with other systems shall be provided.

(5) Check List Prior to Start Up: Precaution and pre-check prior to start up of equipment and/or system, including safety devices, monitoring devices and control sequence shall be provided.

(6) Start Up and Operation: Step-by-step sequential procedures for start up and normal operation checks for satisfactory operation shall be provided. Safety precautions and instructions that should be followed during these procedures shall be incorporated into the operating instructions and flagged for the attention of the operator. Procedures shall include test, manual/normal, and automatic modes.

(7) Shutdown: Procedures for normal and emergency shutdown of equipment and/or systems shall be provided. The instructions shall include any procedures necessary for placing the equipment and or system on standby or preparing the equipment and/or system for start up at a later time. Procedures shall include test, manual/normal, and automatic modes.

(8) Trouble Shooting and Maintenance Procedures: The contractor shall provide a "Trouble Shooting" guide for all install equipment or systems. This trouble shooting guide shall cover both preventive maintenance and repair.

(a) Preventative maintenance trouble shooting instructions shall include recommended operator preventive maintenance which would normally be performed by operating personnel and adjustment procedures necessary for normal operations. Maintenance Procedures shall also indicate preventive maintenance, lubrication, and good house keeping practices which should be performed by operating personnel as well as more complex maintenance procedures which would normally be performed by trained maintenance personnel only. The procedures shall be presented with a schedule indicating time frames or operating hours for specific maintenance to be accomplished. Safety precautions and instructions that should be followed during these procedures shall be incorporated into the maintenance procedure and flagged for the attention of maintenance personnel. The procedures shall include necessary operating instructions for taking equipment off line, lock-out/tag-out, putting equipment on line, or putting equipment on standby. The instructions shall include all necessary material, equipment, and system data to perform maintenance work and shall include, but not be limited to, manufacturers/bulletins, catalogs, and descriptive data; certified performance curves, copies of approved test plans, including logs and records of

performance acceptance test results, and actual adjustments made during final acceptance and inspection; system layouts, including block diagrams, wiring, control, and isometric diagrams: schematic items within the facility; and interrelationships with other items of system. Emergency adjustments shall also be included and flagged for operator's attention. These instructions shall also include procedures for emergency repairs that may be performed by operating personnel. These emergency repairs or "trouble-shooting guides" shall be outlined in three columns with the following headings:

Column 1 - Trouble

Column 2 - Probable Cause(s)

Column 3 – Correction

(b) Repairs: Repair procedures shall be presented with a step-by-step procedure for locating and correcting the trouble. A "shop manual" and illustrated parts catalog shall be used for this purpose. These procedures shall clearly indicate major repair activities which should only be performed in a shop or factory versus normal repair work that may be performed on-site or with equipment on-line. The procedures shall also clearly indicate the limit of repair work that may be performed by Government personnel during the warranty period without voiding warranty provisions. Safety precautions and instructions that should be followed during these procedures shall be incorporated into the repair procedures and flagged for the attention of personnel. Repair procedures shall be keyed to a troubleshooting guide outlined in three columns with the following headings:

Column 1 - Trouble

Column 2 - Probable cause(s)

Column 3 - Correction

(9) Operator Data: The instructions shall include equipment and/or system layouts showing all piping, wiring, breakers, valves, dampers, controls, etc., complete with diagrams, schematics, isometrics, and data to explain the detailed operation and control of each individual piece of equipment and/or system, including system components. Layouts shall show the location within the facility of controls, valves, switches, dampers, etc., by reference to site location, wing designation, floor, room number or other clear and concise directions for locating the item. Operator data may be identical to posted data and framed instructions but shall be prepared as part of the O&M manuals. All control systems operations data shall include the following:

(a) A fully labeled control schematic which details all set points, throttling ranges, actions, spans, proportional bands, and any other adjustment.

(b) A fully labeled elementary diagram (ladder diagram).

(c) A sequence of control on the diagrams cross- referenced to the control schematic and elementary diagram.

(d) A generic, functional description of each control component shown on the drawings.

(e) Catalog data of all control devices.

(10) Tools: The Contractor shall provide one of each nonstandard tool, test instrument, and/or gauge necessary for performing maintenance and repair work. A nonstandard tool, test instrument, and/or gauge is defined an item normally supplied by the manufacturer for the equipment operation or maintenance. The Contractor shall prepare a master list of such items for all equipment and systems, and shall key maintenance and repair procedures to this list. The above referenced items for performing maintenance and repair work shall be provided for each individual facility of multi-facility projects.

(11) Parts and Supplies: A complete list of parts and supplies, to include shop manuals and illustrated parts catalogs, shall be provided with the maintenance instructions. The list shall include all parts and components of individual pieces of equipment or system and shall identify such items as description of part, model number, circuit or component identification, etc. Parts lists, shop manual, and illustrated parts catalogs shall be included within each volume of maintenance instructions. Further, a master list of spare parts and supplies recommended from each manufacturer for 1 year of operation, including source of supply, shall be sublisted with each instruction.

(a) Availability: The Contractor shall list the sources of supply for all parts and supplies, including name of supplier/manufacturer, address, and telephone number. If the parts and supplies are not normally stocked locally, (within 6 hours travel time, round trip by surface transportation) necessary procurement time shall also be a part of the listing.

(b) Spare Parts: The Contractor shall provide those spare parts and supplies that are specified in the TECHNICAL SPECIFICATIONS and those which are normally provided with the equipment or system. A separate master list shall be provided for these items upon turnover to the Government of the parts and supplies.

(12) Maintenance Schedule: A separate schedule of all required periodic maintenance shall be included. This schedule shall list, by frequency of occurrence, all lubricants and special adjustments required. The types and amounts of lubrication

must also be specified. The Contractor shall verify that the furnished maintenance schedule agrees with the published manufacturer's data.

b. Architectural/General O&M Manuals

(1) Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size. composition, and color and texture designations. Provide information for re-ordering custom manufactured products. Data shall include, but not be limited to, information on carpet, floor tile, vinyl wall finishes, builder's hardware, etc.

(2) Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

(3) Moisture-protection and Weather-exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspection, maintenance, and repair.

c. Warranties: In addition to the general warranty required by the contract, all O&M manuals shall include any specific warranties required by other sections of the TECHNICAL SPECIFICATIONS and other warranties normally provided with the particular piece of equipment or system. Extended warranties normally provided by manufacturers that are beyond the warranty of construction shall be specifically noted. The O&M manuals shall also include a specific warranty section itemizing all standard and extended warranty items. The warranty list shall include: item warranted; Contractor's name and Contract Number; Warrantor's name, address and phone number; Warranty period or manufacturer's extended warranty period, and material warranted in the contract. A copy of all warranties shall be included in the manual.

d. Installed Equipment Lists: All O&M manuals shall contain a copy of the completed "Equipment in Place" forms required in SECTION 01702 AS BUILT RECORDS AND DRAWINGS shall be included in the manual.

e. Data Layout

(1) Data Identification: Catalog data shall be marked to clearly identify pertinent data by highlighting the data with pointers.

(2) Drawings: All drawings bound in the manuals shall be of such size that will require only one fold made right to left. All larger size drawings shall be inserted into a separate pocket in the required location in the manual. All drawings shall be of microfilm quality.

3.05 POSTED DATA/INSTRUCTION

A. General: The contractor, in addition to the O&M Manuals, shall provide Posted Data and Framed Instruction for installed equipment or systems.

B. Posted Data: The Contractor shall provide posted data for equipment or systems, in addition to O&M manuals, and as required by the Technical Specification sections. The data shall consist of as-built schematics of all wiring, controls, piping, etc., as necessary for the operation of the equipment or system, and a condensed typewritten description of the equipment or system. The data may be presented in one or several frames, under glass or sheet acrylic glazing, for clarity and convenience of location. The framed data presentation and outline shall be acceptable to and posted at locations designated by the Contracting Officer or his authorized representative. The data shall be posted before personnel training and performance acceptance testing for the equipment or system.

C. Framed Instructions: Typewritten instructions, framed under glass or sheet acrylic glazing, explaining equipment or system pre-start checkout, startup, operating, shutdown procedures, safety precautions, and normal operation checks for satisfactory performance of the equipment of systems shall be posted in conjunction with the posted data. The framed instructions may be presented in one or several frames for clarity and convenience of location. The instruction presentation and outline shall be acceptable to and posted at locations designated by the Contracting Officer or his authorized representative. The data shall be posted before personnel training and performance acceptance testing for the equipment or system.

3.06 PAYMENT

A. General: No separate payment will be made for the preparation and submittal of O&M manuals. All costs incurred by the Contractor in the preparation and submittal of O&M manuals shall be considered as part of the price for the equipment and included in the contract price. Approval and acceptance of the final O&M manuals shall be accomplished before final payment is made to the Contractor.

3.07 WARRANTIES

A. In addition to the general warranty required by the contract, the O&M manuals shall include any specific warranties required by other sections of the TECHNICAL SPECIFICATIONS and other warranties normally provided with the particular piece of equipment or system. Extended warranties normally provided by manufacturers that are beyond the warranty of construction shall be specifically noted. The O&M manuals shall also include a specific warranty section itemizing all standard and extended warranty items. The warranty list shall be as indicated below. warranties will not begin until the facility is accepted by the Contracting Officer. Copy of warranty shall be included in the manual.

WARRANTY INFORMATION

Project Title
Contract Number

General Contractors Name, Phone Number

ITEM DESCRIPTION	START DATE	END DATE	O&M REFERENCE LOCATION

(in alphabetical order)

Descriptive Name,
Manufacturers/
Warrantors Name
Address & Phone No.

3.08 CHECKLIST

A. Contractor shall complete and initial a copy of the O&M Manual Check List which is provided at the end of this section, and forward it as part of the O&M Manual submittal to the Contracting Officer for approval.

O&M MANUAL - REVIEW CHECKLIST

__ Does the manual cover all equipment furnished under the contract? (Review against equipment schedules on the drawings and/or equipment submittals.)

__ Does the manual clearly highlight all relevant portions or cross out all irrelevant portions of catalog data?

__ Does the manual contain operations data for the equipment? (Step-by-step operating instructions, start up procedures, sequences of operation, precautions.)

__ Does the manual contain operations data for the equipment? (Lubrication, dismantling, assembly, adjustment, troubleshooting.)

__ Does the manual contain a separate maintenance schedule listed by frequency of occurrence?

__ Does the manual contain parts lists or parts catalogs for the equipment? Parts catalog or list shall contain identification, part numbers, recommended parts to be stocked, and local source of parts.

__ Does the manual contain electrical connection diagrams?

__ Does the manual contain control and interlock system diagrams where applicable?

__ Is every page in the manual numbered and an index provided for ready reference to the data?

__ Is the cover hard (non-flexible) with the facility name, identification number, location, and system embossed on both the spine and cover? Is the Contractor's name and address, and the contract title and contract number embossed on the inside of the manual cover?

__ Is the binding screw posts or sliding post?

__ Is any of the data in the manual under the binding where it cannot be seen?

__ Do three sets of manuals contain all original data sheets and are others clearly legible?

__ Are system layout drawings provided? (Simplified diagrams for the system as installed.)

__ Are all drawings in the manual of such a size that requires one fold right to left, or if a larger size drawing, then inserted into a pocket in the manual?

Note: The above are common requirements to all contracts. Check the specific contract for additional information.

END OF SECTION

DIVISION 1

SECTION 01702 – AS-BUILT RECORDS AND DRAWINGS

A. When developing specifications for this section, use the standard Fairchild Air Force Base specifications developed by the 92d Civil Engineer Squadron Engineering Flight and edit for the specific project. See attached specification for example.

B. The Contractor shall keep at the construction site a complete set of full size blueline prints of the contract drawings, reproduced at the contractor's expense. During construction, these prints shall be marked to show all deviations in actual construction from the contract drawings. The color red shall be used to indicate all additions and green to indicate all deletions.

END OF SECTION

SECTION 01702 - AS BUILT RECORDS AND DRAWINGS

PART 1 GENERAL

1.01 SUBMITTALS

A. Data listed in Part 3 of this section shall be submitted in accordance with Section 01300 Submittals. Due dates shall be as indicated in applicable paragraphs and all submittals shall be completed before final payment will be made.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.01 AS-BUILT FIELD DATA

A. General: The Contractor shall keep at the construction site a complete set of full size blueline prints of the contract drawings, reproduced at the contractor's expense. During construction, these prints shall be marked to show all deviations in actual construction from the contract drawings. The color red shall be used to indicate all additions and green to indicate all deletions. The drawings shall show the following information but not be limited to:

1. The locations and description of any utility lines and other installations of any kind or description known to exist within the construction area. This includes all marked and unmarked utilities discovered during excavation. These locations include dimensions to permanent features such as corners of buildings, permanent survey markers, fire hydrants, etc.

2. The location and dimension of any changes within the building or structure, and the accurate location and dimension of underground utilities and facilities.

3. Correct grade or alignment of roads, structures, and utilities if any changes were made from the contract plans.

4. Correct elevations if changes were made in site grading from the contract plans.

5. Changes in details of design, or additional information obtained from working drawings prepared and/or furnished by the Contractor including, but not limited to, fabrication, erection, installation, and planing details, pipe sized, insulation material dimensions of equipment, foundations, etc.

6. The topography and grades of all drainage installed or affected as part of the project construction.

7. All changes or modifications from the original design and the final inspection.

8. Where contract drawings or specifications allow options, only the option actually used in the construction shall be shown on the as-built drawings. The option not used shall be deleted.

9. These deviations shall be shown in the same general detail utilized in the contract drawings. Markings of the prints shall be pursued continuously during construction to keep them up to date. In addition, the contractor shall maintain full size marked-up drawings, survey notes, sketches, nameplate data, pricing information, description, and serial numbers of all installed equipment. This information shall be maintained in a current condition at all times until the completion of the work. The resulting field-marked prints and data shall be referred to and marked as " As-Built Field Data", and shall be used for no other purpose. They shall be made available for inspection by the Contracting Officer's representative whenever requested during construction and shall be jointly inspected for accuracy and completeness by the Contracting Officer's representative and a responsible representative of the Contractor prior to submission of each monthly pay estimate. Failure to keep the As-Built Field Data (including Equipment-in Place lists) current shall be sufficient justification to withhold a retained percentage from the monthly pay estimate.

B. Submittal of the As-Built Field Data: The As-Built Field Data shall be submitted to the Contracting Officer for review and approval a minimum of 20 calendar days prior to the date of final inspection. If review of the preliminary as-built drawings reveal errors and/or omissions, the drawings will be returned to the Contractor for corrections. The Contractor shall make all corrections and return the drawings to the Contracting Officer within 10 calendar days of receipt.

3.02 AS-BUILT CONTRACT ORIGINAL RECORD DRAWINGS ON CADD SYSTEM

A. General: Approved preliminary as-built drawings will be returned to the Contractor along with one set of the original record drawings on 3.5" computer disc. The Contractor shall draft all as-built data onto these discs using the same AutoCad version and format as the original record drawings. The drafting work shall be performed by certified CADD technicians with architectural drafting experience and/or individuals with a minimum of five years architectural CADD experience. The names and qualifications of these individuals shall be submitted in writing to the Contracting Officer for approval.

B. Drafting of the data onto the original record drawing discs shall be done in a quality equal to that of the original record drawings. Drafting shall be consistent with the original record drawings in regard to text style, text size, symbols, layers, line type etc. If the creation of additional drawings is required, the drawings will have the same type title block and borders as the original drawings. The Contractor shall be provided with a prototype drawing of the title block and borders by the government. When final revisions have been completed, each drawing shall have the words " AS-BUILT" in block letters at least 3/8" high placed in the lower right corner of the drawing area if space permits, otherwise, place below the title block between the border and the trim line. The date of completion and the words "REVISED AS-BUILTS" shall be placed in the revision block above the latest revision notation. The Contractor shall provide the government with a complete set of the final as-built project drawings on 24" X 36" mylar drafting media. All costs of drafting, drawing preparation, and materials shall be at the Contractor's expense.

C. Submittal: The final as-built record drawings on computer disc and on 24" X 36" mylar shall be completed and returned together with the approved preliminary as-built drawings to the Contracting Officer within 30 calendar days of the final inspection. The Contracting Officer will review all final as-built record drawings for accuracy, conformance to the drafting standards and other requirements contained in this section. The drawings shall be returned to the Contractor of corrections are necessary. The Contractor shall make all corrections and shall return the drawings to the Contracting Officer within seven calendar days of receipt.

D. Payment: All costs incurred by the Contractor in the preparation and furnishing of as-built drawings shall be included in the contract price and no separate payment will be made for this work. Approval and acceptance of the final as-built record drawings shall be accomplished before final payment is made to the Contractor.

END OF SECTION

DIVISION 1

SECTION 01704 – FORM 1354 CHECKLIST

A. When developing specifications for this section, use the standard Fairchild Air Force Base specifications developed by the 92d Civil Engineer Squadron Engineering Flight and edit for the specific project. See attached specification for example.

B. When the project provides new facilities or additional real property items, as part of the construction of a project, the designer shall include section 01704, Form 1354 Checklist, in the project specifications. This section is required to ensure the Contractor provides a completed DD Form 1354 Checklist. This list is required for contract close-out and updating of real property records.

END OF SECTION

DIVISION 1

SECTION 01704 - FORM 1354 CHECKLIST

PART 1 - GENERAL

1.01 PROCEDURES

A. The form which is a part of this specification section shall be completed for any project having revisions to real property. The following page contains the basic instructions applicable to the form.

1.02 SUBMITTAL

A. This form shall be submitted for approval, and be approved a minimum of 30 days before final inspection of the project. Failure to have this form completed and approved in time for the final inspection will result in delay of the inspection until the checklist is completed.

1.03 INSTRUCTIONS FOR DD FORM 1354 CHECKLIST

A. The following checklist is only a guide to describe various parts of new and modified construction. Alter this form as necessary or create your own document to give complete accounting of the real property added or deleted for this contract. All items added, deleted, replaced, or relocated on site five feet beyond the building perimeter must be accounted for completely. Only a few of the most common items are included on the checklist under UTILITIES/SURFACE CONSTRUCTION. Attach a continuation sheet and use the checklist format to describe other work related to this particular project. Listed on the last page are additional items with units of measure and descriptive terms.

C. Cost for <u>each</u> item must include material, tax, installation, overhead and profit, bond and insurance costs. This form should be filled out as each item is installed or each phase of work is completed.

D. TOTAL FOR ALL ITEMS INCLUDING CONTRACT MODIFICATION COSTS ADDED TOGETHER SHOULD EQUAL THE TOTAL CONTRACT PRICE.

E. KEY TO ABBREVIATIONS

AC	Acres
BL	Barrels, Capacity
BTU	British Thermal Unit
CY	Cubic Yards
EA	Each
GA	Gallons, Capacity
HD	Head
KV	Kilovolt - Amperes, Capacity (kVa)
KW	Kilowatts, Capacity
SE	Seats
SF	Square Feet
SY	Square Yard
MB	Million British Thermal Units
MI	Miles
LF	Linear Feet
KG	Thousand Gallons Per Day, Capacity
TN	Ton
#	Number; How Many

DD FORM 1354 CHECKLIST

Transfer of Real Property

CONTRACT NUMBER:_____

CONTRACT TITLE:_____

LOCATION:_____

1. **DEMOLITION** (Describe each item removed and the cost of removal.)*

2. **RELOCATION** (Describe each item relocated and the cost of relocation.)*

3. **REPLACEMENTS** (Describe each item replaced and replacement cost.)*

*Use a continuation sheet if more space is required. Items should be described by quantity and the correct unit of measure.

4. **NEW CONSTRUCTION OVERVIEW: BUILDING(S)/ADDITION(S) TO A BUILDING** - Use a separate checklist for each building and/or addition.

(1) **Outside Dimensions: Length x Width**

(a) Main Building_____
(b) Offsets_____
(c) Wings_____
(d) Basement_____
(e) Attic_____

(2) **Number of Usable Floors:_____**

(3) **Construction: Exterior Materials Used**

(a) Foundation (such as concrete)_____
(b) Floors (such as wood, concrete)_____
(c) Walls (such as wood siding, metal, CMU)_____
(d) Roof (such as metal, comp., built-up)_____

(4) **Utilities ENTERING Building:** Measure LF from building entry to next larger size of pipe.

(a) Water (size & type of pipe; number of LF)_____
(b) Gas (size & type of pipe; number of LF)_____
(c) Sewer (size & type of pipe; number of LF)_____
(d) Electric (phase, voltage, size & type of wire, connected load in amps_____

(5) **Air Conditioning:**

(a) Type_____
(b) Capacity (TONS)_____
(c) SQ YDS covered by system_____

(6) **Heating:**

(a) Source_____
(b) Fuel_____

(7) **Hot Water Facilities:**

(a) Capacity (GAL)_____
(b) Temperature Rise_____

BUILDING COST:_____

5. **BUILDING SYSTEMS (INTERIOR)**

A. **FIRE PROTECTION:**

B. **SECURITY:**

C. **HEATING/COOLING SYSTEMS:**

SITE WORK

6. **UTILITIES/SOURFACE CONSTRUCTION:**

7. INSTALLED EQUIPMENT: Furnish an Equipment-In-Place List. Any price related to equipment should already be included in this checklist.

8. **SYSTEMS NOT PREVIOUSLY LISTED:** Attach a separate sheet and use the same format to describe the system(s). Example: CATV system, intercom system, or other utilities and surface construction not described on this checklist.

9. **ASBESTOS REMOVAL:** Furnish a description by building of the number of LF of asbestos removed, number of LF of reinsulation, number of SF of soil encapsulation, and number and size of tanks, etc., where asbestos was removed. Also, identify buildings by their numbers and use.

10. **MAINTENANCE/RENOVATION:** List by building number and describe all additions and deletions by quantity and the correct unit of measure. Furnish a cost per building.

11. **DEMOLITION:**

UTILITIES/SURFACE CONSTRUCITON - Listed below are some additional items which may or may not apply to your contract, EACH item installed on site should be listed and priced separately even if not included on this checklist.

(1) IRRIGATION SYSTEM - (LF of pipe; size & type of pipe; number and type of heads)
(2) UNDERGROUND/ABOVEGROUND STORAGE TANKS - (GA, type of tank; material stored)
(3) (833-354) DUMPSTER ENCLOSURE - (SF & dimensions)
(4) (890-152) UNLOADING PAD - (SY; material)
(5) SIGNAGE - (Dimensions; material)
(6) (12580) CATHODIC PROTECTION - (MI; LF)
(7) (87270) LIGHTNING PROTECTION -(LF)
(8) (81290) POLE DUCT RISER - (LF, type of material)
(9) RAMPS - (SF, material; CY if concrete - use code for sidewalk if concrete)
(10) (89080/8890-158) LOAD AND UNLOAD PLATFORM - (SF)
(11) (83240/832-255) INDUSTRIAL WASTE MAIN - (LF)
(12) WHEEL STOPS - (EA; size & material)
(13) (81350) OUTDOOR INTEGRAL DISTR CTR-(KVA)
(14) (45110) OUTDOOR STROAGE AREA - (SF)
(15) (73055/730-275) BUS/WAIT SHELTER-(SF)
(16) (690-432) FLAGPOLE (EA; dimensions)
(17) (93210) SITE IMPROVEMENT -(JOB)
(18) (93220) LANDSCAPE PLANTING (Acre: EA; SF)
(19) (93230) LANDSCAPE BERMS/MOUNDS -(SY)
(20) (93410) CUT AND FILL - (CY)
(21) (843-315) FIRE HYDRANT - (EA; Type)
(22) (14970) LOADING AND UNLOADING DOCKS AND RAMPS (not connected to a Bldg.) - (SF)
(23) BICYLCE RACK - (EA)
(24) (85140/812-928) TRAFFIC SIGNASL - (EA)
(25) (87210) FENCING OR WALLS - (LF)
(26) (15432) RIPPER - (LF & SY)
(27) (75061) GRANDSTAND OR BLEACHERS - (EA; SE)

(28) (87150/871-187) RETAINING WALLS - (LF; SY; material)

NOTE: 5 Digit Codes - Army; 6 Digit Codes - Air Force

PARTS 2 AND 3 NOT APPLICABLE

END OF SECTION 01704

DIVISION 1

SECTION 01705 – EQUIPMENT-IN-PLACE CHECKLIST

A. When developing specifications for this section, use the standard Fairchild Air Force Base specifications developed by the 92d Civil Engineer Squadron Engineering Flight and edit for the specific project. See attached specification for example.

B. When the project provides equipment as part of the construction of a project, the designer shall include section 01705, Equipment-In-Place List, in the project specifications. This section is required to ensure the Contractor provides a list of equipment in place. This list is required for contract close-out and updating of real property records.

END OF SECTION

SECTION 01705 - EQUIPMENT-IN-PLACE LIST

PART 1 - GENERAL

1.01 SUBMITTALS

A. Data listed in PART 3 of this section shall be submitted in accordance with section 01300 SUBMITTALS. Due dates shall be as indicated in applicable paragraphs and all submittals shall be completed before final payment will be made.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.01 SUBMITTAL

A. The final equipment-in-place list shall be completed and returned to the Contracting Officer within 30 calendar days of the final inspection. The Contracting Officer will review all final Equipment-In-Place Lists for accuracy and conformance to the requirements contained in DIVISION 1 GENERAL REQUIREMENTS. The lists shall be returned to the Contractor if corrections are necessary. The Contractor shall make all corrections and shall return the lists to the Contracting Officer within seven calendar days of receipt.

3.02 EQUIPMENT-IN-PLACE LIST

A. Contractor shall submit for approval, at the completion of construction, a list of equipment-in-place. This list shall be updated and kept current throughout construction, and shall be jointly inspected for accuracy and completeness by the Contracting Officer's representative and a responsible representative of the Contractor prior to submission of each monthly pay estimate. A sample form showing minimum data required is provided at the end of this section.

The EQUIPMENT-IN-PLACE LIST shall be comprised of all equipment falling under one or more of the following classifications:

(1) Each piece of equipment listed on the mechanical equipment schedules.
(2) Each electrical panel, switchboard, and MCC panel.
(3) Each transformer.
(4) Each piece of equipment or furniture designed to be movable.

(5) Each piece of equipment that contains a manufacturer's serial number on the name plate.

3.03 PAYMENT

A. All costs incurred by the Contractor in the preparation and furnish Equipment-In-Place Lists shall be included in the contract price and no separate payment will be made for this work. Approval and acceptance of the final Equipment-In-Place lists shall be accomplished before final payment is made to the Contractor.

EQUIPMENT-IN-PLACE LIST

CONTRACT NO.:_____

Specification Section:_____Paragraph No.:_____

ITEM DESCRIPTION:_____

Item Name:_____

Serial Number:_____

Model Number:_____

Capacity:_____Replacement Cost_____

ITEM LOCATION:

Building Number:_____Room Number:_____

or Column Location:_____

MANUFACTURER INFORMATION:

Manufacturer's Address:_____

_____

_____

Trade Name (if different from item name)_____

Manufacturer's Address:_____

_____

_____

Telephone Number:_____

WARRANTY PERIOD:_____

Checked by:_____

END OF SECTION

DIVISION 1

SECTION 01740 - WARRANTIES

A. When developing specifications for this section, use the standard Fairchild Air Force Base specifications developed by the 92d Civil Engineer Squadron Engineering Flight and edit for the specific project. See attached specification for example.

B. Submit written warranties to the Government prior to the date certified for Substantial Completion. If the Government's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Government.

END OF SECTION

SECTION 01740 - WARRANTIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes administrative and procedural requirements for warranties required by the Contract Documents, including manufacturers standard warranties on products and special warranties.

1. Refer to the General Conditions for terms of the Contractor's period for correction of the Work.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section "Submittals" specifies procedures for submitting warranties.

2. Division 1 Section "Contract Closeout" specifies contract closeout procedures.

3. Divisions 2 through 16 Sections for specific requirements for warranties on products and installations specified to be warranted.

4. Certifications and other commitments and agreements for continuing services to Government are specified elsewhere in the Contract Documents.

C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

D. Separate Prime Contracts: Each prime contractor is responsible for warranties related to its own contract.

1.03 DEFINITIONS

A. Standard product warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Government.

B. Special warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Government.

1.04 WARRANTY REQUIREMENTS

A. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.

B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Government has benefited from use of the Work through a portion of its anticipated useful service life.

D. Government's Recourse: Expressed warranties made to the Government are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Government can enforce such other duties, obligations, rights, or remedies.

1. Rejection of Warranties: The Government reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

E. Where the Contract Documents require a special warranty, or similar commitment on the Work or part of the Work, the Government reserves the right to refuse to accept the Work, until the Contractor presents evidence that entities required to countersign such commitments are willing to do so.

1.05 SUBMITTALS

A. Submit written warranties to the Government prior to the date certified for Substantial Completion. If the Government's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Government.

   1. When a designated portion of the Work is completed and occupied or used by the Government, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Government within 15 days of completion of that designated portion of the Work.

B. When the Contract Documents require the Contractor, or the Contractor and a subcontractor, supplier or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Government, through the Contracting Officer, for approval prior to final execution.

C. Forms for special warranties are included at the end of this Section. Prepare a written document utilizing the appropriate form, ready for execution by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Submit a draft to the Government, through the Contracting Officer, for approval prior to final execution.

   1. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.

D. Form of Submittal: At Final Completion compile 2 copies of each required warranty properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.

E. Bind warranties and bonds in heavy-duty, commercial-quality, durable 3-ring, vinyl-covered loose-leaf binders, as indicated in General Requirements Section 01701 "Operations and Maintenance Manuals."

   1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address, and telephone number of the Installer.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 LIST OF WARRANTIES

A. Provide warranties on products (and their installations), such as (but not limited to) carpet, doors, windows, roofing, hardware, equipment, etc.

END OF SECTION

DIVISION 2

SECTION 02000 - GENERAL INFORMATION

A. GENERAL

1. It shall be the responsibility of the designer to correctly locate existing utilities. During the design phase, all utilities shall be located using state-plane coordinates and marked on the utility site plan. (Refer to Attachment 1 at the end of this Section for Utility Verification Procedures). As-built drawings of facilities showing utilities shall be confirmed. Site plans showing utility locations shall also include the depth of the utility. Project utility site plan(s), with dimensioned, designer-verified existing utilities,, shall be used in the approval of the AF Form 103, Base Civil Engineer Work Request.

2. Designs shall specify and illustrate the "Project Limits", to clearly identify the specific area to which the contractor's activities shall be restricted. Project limit lines should be expanded to include utility corridors.

3. A welding permit is required prior to performing any welding, cutting, grinding, or any spark producing operations, especially in areas designated as hazardous/flammable areas. This can be obtained from the Base Fire Department, Duty Chief (Alarm Room).

4. No topsoil or fill is available on Fairchild AFB (FAFB).

5. Excavated material shall be hauled off base to a landfill site approved by the Contracting Officer. Copies of all dump receipts shall be submitted to the Contracting Officer.

6. Fairchild Air Force Base has adopted the " Affirmative Procurement Plan" dated August 1999 regarding recycling and conserving resources. The Plan requires that some construction materials, such as **patio blocks containing recovered rubber or plastic**, transportation products, such as **wheel stops for parking**, and landscaping products, such as **hydraulic mulch (containing recovered paper or recovered wood),** be composed of a minimum percentage of recycled products. It is therefore mandatory that designers obtain a copy of the Plan from the Contracting Officer in order to familiarize themselves with the requirements related to developing specifications for the particular product, possible exemptions allowed, and required documentation for both the design analysis and the construction phase.

B. BASE ROADS AND PARKING LOTS

1. Base roads and parking lots shall be designed for the appropriate level of vehicle traffic. Parking lots shall be located away from the front of the building. Parking lot designs shall

allow for removal of snow and ice. Provide integral, rolled Portland Cement Concrete curb and gutter for both roads and parking lots.

2. Street/road and parking lot (as well as taxi-way and runway) repairs shall be completed within 48 hours of demolition operations. If repair is scheduled for more than 48 hours after demolition operations, then a cold mix shall be used as a temporary installation until the hot mix becomes available.

3. Base roads/streets are composed of asphaltic concrete (AC) pavement, while some overlay existing Portland cement concrete (PCC) roadway. Road/street lane widths range from 10 feet (3.0 meters) to 15 feet (4.6 meters). All new pavement lane widths shall be 12 feet (3.7 meters) where possible.

4. At all projects calling for the installation of new paved roads or the resurfacing of existing paved roads, designer shall specify the installation of two 4"-diameter conduit sleeves under the road to be paved for the accommodation of future power and communication lines. Two such sleeves shall be installed beneath each branch of each intersection and also beneath the roadway at reasonable intervals between intersections.

5. If recycled PCC is to be used for base course designer shall specify that appropriate conditions shall exist (e.g., documented resistance to sulfate attack), as well as, compliance with WSDOT or CoE specifications.

C. AIRFIELD PAVEMENTS

1. The United States Air Force has very stringent and specific requirements for airfield pavements. Consult the Air Force project manager to obtain a copy of the latest guide specifications/handbooks for any airfield pavement projects.

D. WASTE HANDLING

1. Designs shall specify that during construction/demolition operations contractor shall provide the Contracting Officer with all dump receipts for waste disposal. See the BDS Site Work section for additional information.

E. CLIMATE

1. Rainfall design shall be based on a 25 year storm; 4 inches (100 mm) per hour for a duration of 5 minutes.

2. The normal construction season for exterior work is 15 April through 15 October. Some years are mild and construction can start 30 to 45 days earlier and/or continue 30 to 45 days later.

3. Although the mean winter temperatures are in the mid-twenties, the combination of wind (predominantly NE/SW) speed and temperature gives a mean equivalent chill temperature for January of 14 degrees F (-10 degrees C).

F. WASTE, SANITARY AND INDUSTRIAL

1. Fairchild is connected to the City of Spokane Regional Sewer Plant. Design capacity of the new line specifies an average daily flow of 1 MGD with a peaking factor of 2.5.

G. PETROLEUM-CONTAMINATED SOIL

Refer to Section 00003 Environmental; Paragraph G.

H. STORM DRAINAGE

1. Fairchild' s primary stormwater control objective is to prevent all future development of Base facilities from adding to the present runoff quantity leaving the Base. This means that all future development design shall provide sufficient controls to ensure there is no increase in stormwater runoff at sites that are developed on Fairchild AFB. The preferred approach to excess runoff control is infiltration, which disposes of stormwater without the need for extensive conveyance and/or evaporative pond systems. *This is especially critical on or near the flightline where birds, attracted to ponds, can interfere with aircraft.*

2. Designs shall take into consideration increased runoff from development, where grasslands and trees are replaced with impervious surfaces such as buildings, parking areas and roadways, and frozen soil, when the ground becomes an impervious surface and prevents infiltration.

3. Refer to Fairchild AFB Stormwater Management Plan and Stormwater Management Procedures Manual, September 1998. Spokane County Guidelines for Stormwater Management (February 1998) shall also be adhered to for additional design standards.

I. UTILITY LINES

1. All utility lines provided shall have a plastic marker tape installed above line and 8-10 inches (200-250 mm) below grade. The plastic marker tape shall include a metallic wire for detection purposes and shall indicate the type of utility line buried below. Utility line monument markers shall be installed every 200 feet (61 meters) along straight runs and at each change of direction.

2. No gas regulators, transformers, exterior HVAC, fire hydrants, etc. shall be provided at entryways to facilities.

3. Exterior equipment such as bollards, gas regulators, transformers, exterior HVAC, fire hydrants, etc. shall be painted to match Sherwin-Williams' color #SW2070, "Spanish Moss" when located in open areas or adjacent to brick facilities. Exterior equipment such as bollards, gas regulators, transformers, exterior HVAC, fire hydrants, etc. shall be Federal Color Standard 595A, Color X3578, Antique Linen, when located adjacent to Antique Linen colored facilities.

4. All underground utilities shall be placed parallel to roads/streets within a 50-foot (15-meter) corridor. Service connections shall be installed perpendicular to mains and avoid crossing large developable spaces.

5. Where new utilities must cross under existing roads, base policy is to run them through existing ductbanks, if possible. If new ductbanks/lines are needed, they shall be horizontally bored/drilled under the road/pavement. Street cutting will be an exception justified only by the road already being in such bad shape that a patch is better than the existing road or the extent of the new utilities makes boring/drilling impossible. (Justification for any and all street cuts should be included in the Design Analysis). Completely restore sites disturbed by boring/drilling operations.

6. All utilities shall be metered at building' s end and all services shall be marked.

J. UTILITY VERIFICATION PROCESS (During Design of Fairchild AFB Projects)

This information summarizes the procedures that need to be taken to ensure all existing utilities are accurately depicted on the Site Utility Plan for all current, and future, designs.

1. PURPOSE: The designer is tasked with the responsibility for verifying the location of existing utilities within their project site. Through the verification process, better information is provided to contractors for bidding and construction; the number of unplanned utility outages is greatly reduced; and there is less redesign, fewer construction delays, and fewer modifications after contract award.

2. PROCEDURES:

   a. Development of Project Limit Line (PLL): The designer determines the PLL at 35% design. The PLL must take into account perimeter fencing requirements and all utility corridors.

   b. Initiating the AF Form 103: The designer is responsible for initiating the AF Form 103.

      (1) Overlaying the Comprehensive Utility Plan: The designer draws the PLL on the Comprehensive Utility Plan (CUP) provided by the BCE.

      (2) Marking the PLL at the Project Site: The designer marks the PLL at the project site in accordance with the APWA Uniform Color Code standards.

      (3) Submitting the AF Form 103: The designer clearly annotates on the CUP how the PLL was marked in the field (e.g., "The site was marked with white stakes at all corners"). The designer then attaches 4 copies of the annotated CUP to an AF Form 103 and provides it to the BCE PM for processing. The description block of the AF Form 103 shall say "Verification of Existing Utilities for *[insert name of project]*". A POC, who can respond to field questions, must be clearly identified in the "Requestor" block of the AF Form 103 in case questions develop during the utility marking process.

   c. Processing the AF Form 103: The BCE PM is responsible for processing the AF Form 103 within 14 days.

(1) Assigning A Tracking Number: The BCE PM will coordinate with the Engineering Flight AF Form 103 Monitor, who will assign the permit a tracking number and ensure that the AF Form 103 has been submitted in the proper format.

(2) Obtaining Signatures: The BCE PM will take the AF Form 103 to the weekly coordination meeting at 0900 hours on the first Tuesday after receiving the AF Form 103. He/she will follow Base Instructions to obtain signatures for all coordination blocks.

(3) Marking Existing Utilities at the Project Site: Utilities within the PLL will be marked on the ground by the responsible organization. All marking will be in accordance with the APWA Uniform Color Code standards. In some instances, the organization responsible for utility marking will annotate the AF Form 103 with words similar to "Call 48 hours prior to digging". When this occurs, the Requestor is responsible for calling the organization to coordinate marking after the AF Form 103 has been returned.

(4) Approval of the AF Form 103: The AF Form 103 is considered approved when the Chief Engineer signs the approval block. Upon approval, the BCE PM notifies the Requestor that the permit is ready for pick up. The BCE PM gives the original copy of the AF Form 103, with attachments, to the Requestor and keeps a copy, with attachments, for the BCE project file.

d. Coordinating Final Utility Markings: Upon receipt of the approved AF Form 103, the Requestor makes contact with any organizations that require 48 hours notice prior to marking utilities. If the Requestor has difficulties in getting AF personnel to physically mark the location of existing utilities, he/she will contact the BCE PM for assistance.

e. Verification of Existing Utilities: The designer is responsible for ensuring that all existing utilities are accurately shown on a Site Utility Plan and that all discrepancies in the CUP are brought to the attention of the BCE.

(1) Questionable Utility Markings: If there is a question about the actual location of any utility, it is the responsibility of the designer to determine the actual location of the utility. This process includes, but is not limited to, investigating physical features at the project site (nearby manholes, curb stops, fire hydrants, steam pits, etc.); calling the appropriate agency, as shown on the AF Form 103, to verify it' s markings; and digging up the utility to determine its actual location.

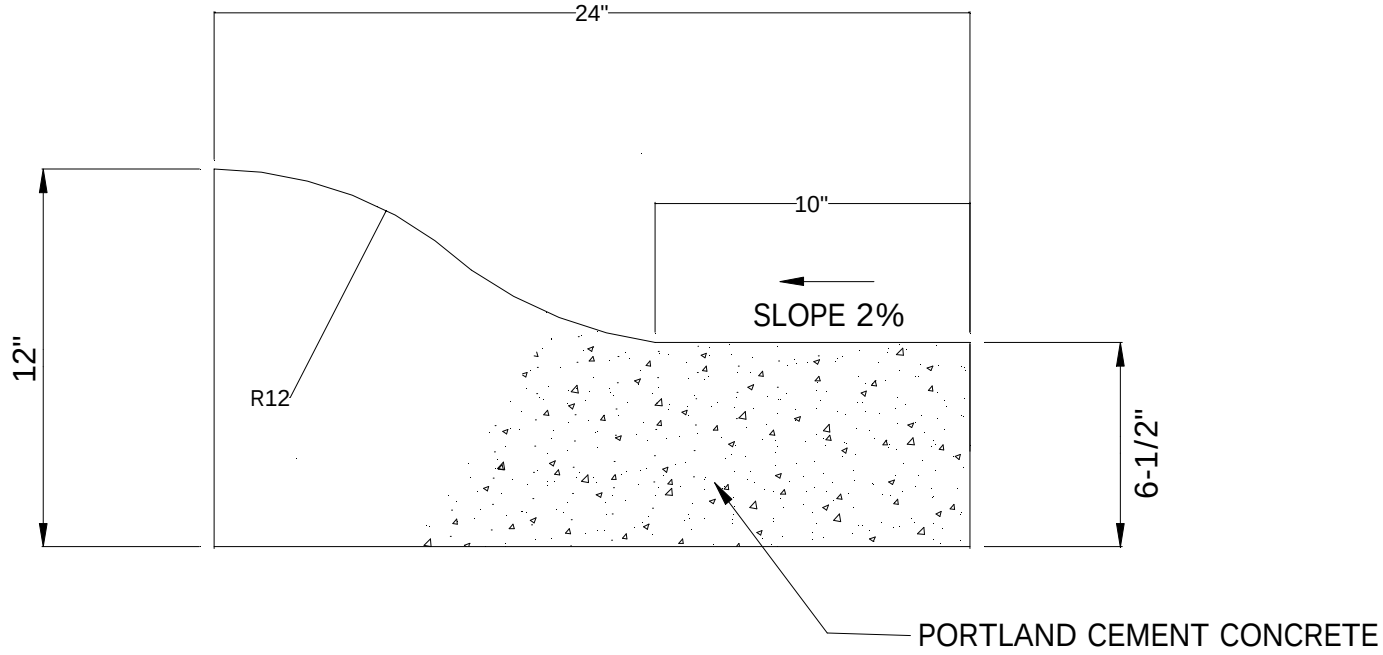
(2) Missing Utility Markings: If a utility line is shown on the CUP, but a corresponding mark is not on the ground at the project site, the designer is responsible for resolving the discrepancy. The procedures described in the previous paragraph are to be used in the verification process.

(3) Creation of the Site Utility Plan: The designer is responsible for surveying the actual location of all utilities within the PLL and showing the information (including grid coordinates and depth where critical for utility tie-ins, utility crossings, etc.) on a Site Utility Plan for the project.

(4) Notifying the BCE of Errors in the CUP: The designer is responsible for formally notifying the BCE PM of all discrepancies between the actual location of existing utilities and the location shown on the CUP within 14 days after the creation of the Site Utility Plan. The notification shall be in the form of an annotated CUP that shows the actual, verified location (including grid coordinates and depth) relative to the location shown on the CUP.

(5) Updating the CUP: The BCE PM is responsible for formally notifying the Maintenance Engineering Section, 92 CES/CEOE, of discrepancies in the CUP within 14 days. CEOE is responsible for updating the CUP, and related base maps, within 30 days.

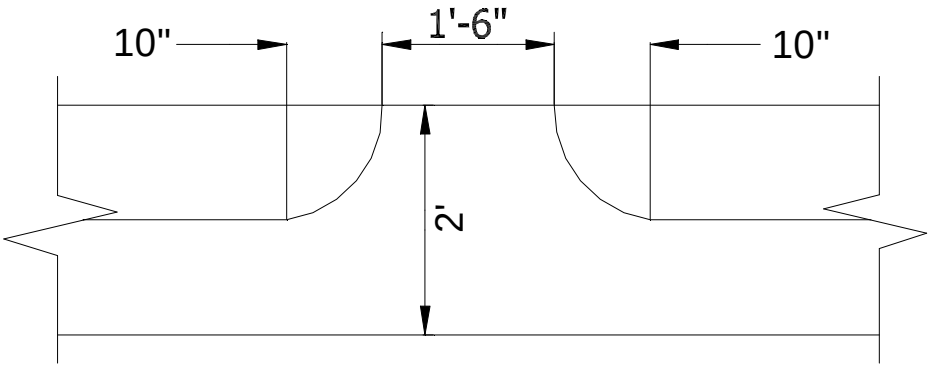
END OF SECTION



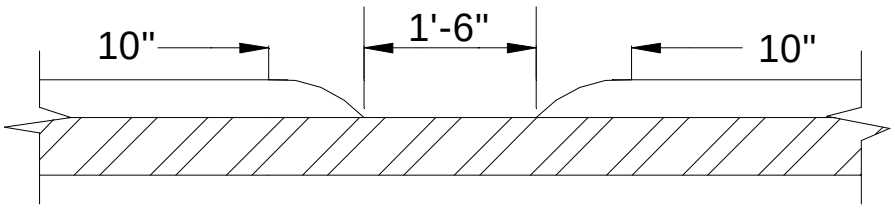
SECTION, TYPICAL CURB AND GUTTER

1

SCALE: NONE



PLAN VIEW

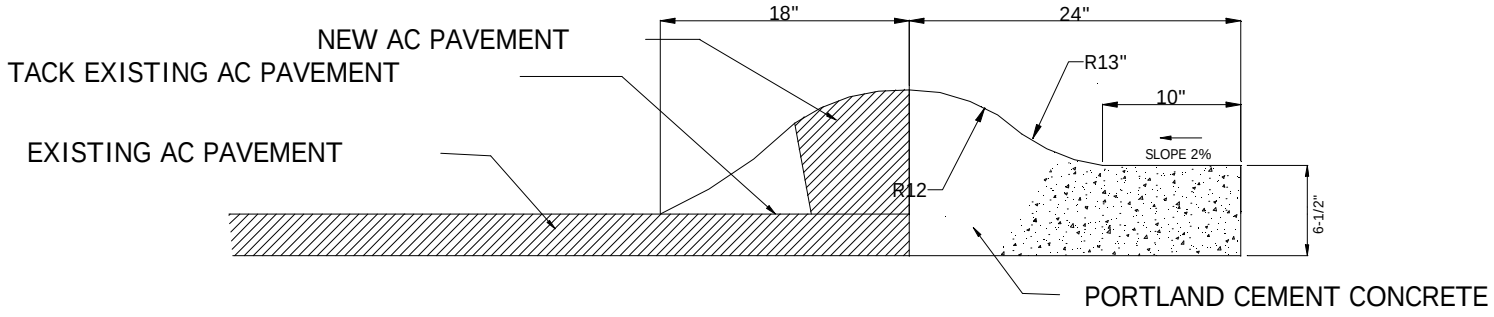


ELEVATION

DETAIL, TYPICAL CURB CUT

2

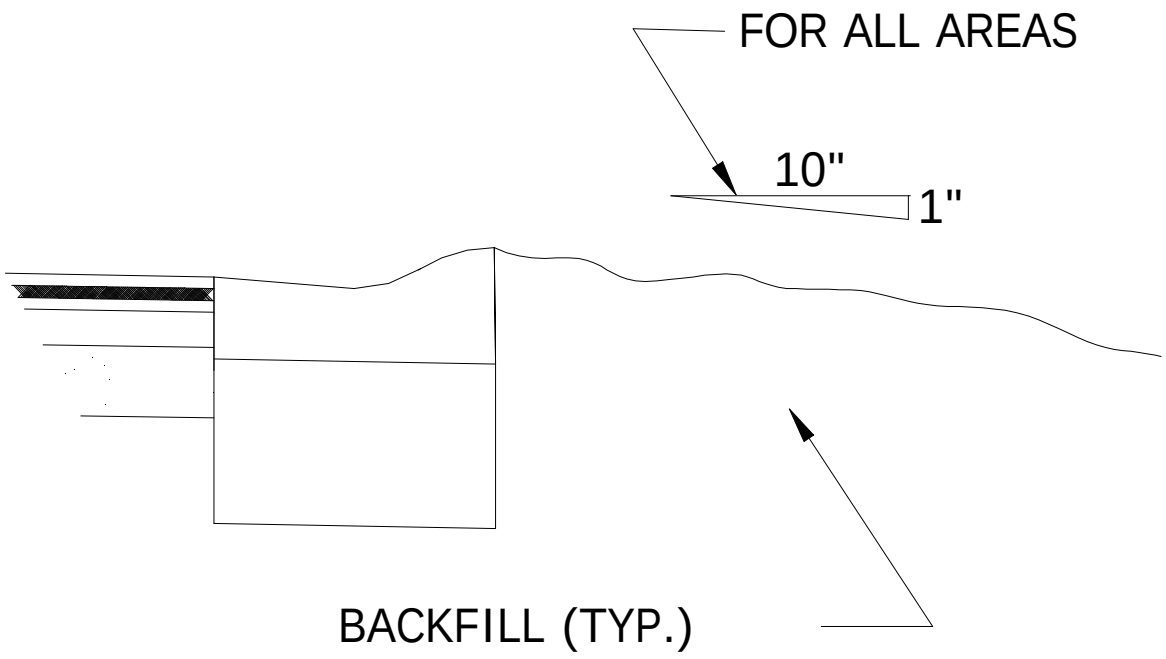
SCALE: NONE



SECTION, ASPHALT CURB BACKING

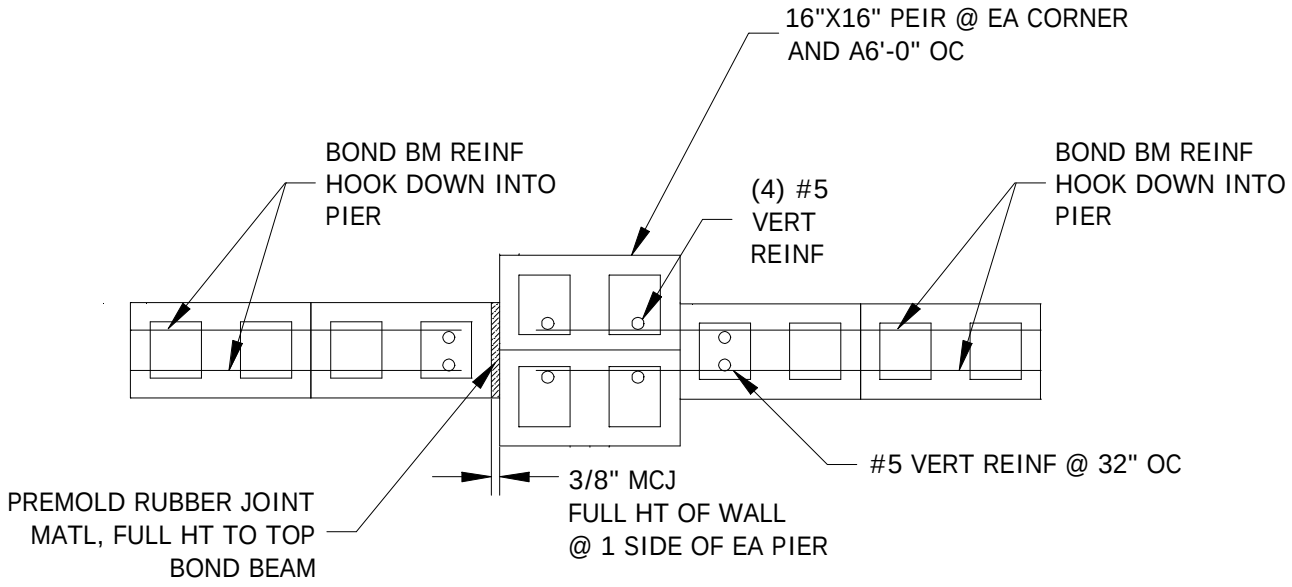
3

SCALE: NONE



4 SECTION, EARTHEN CURB BACKING

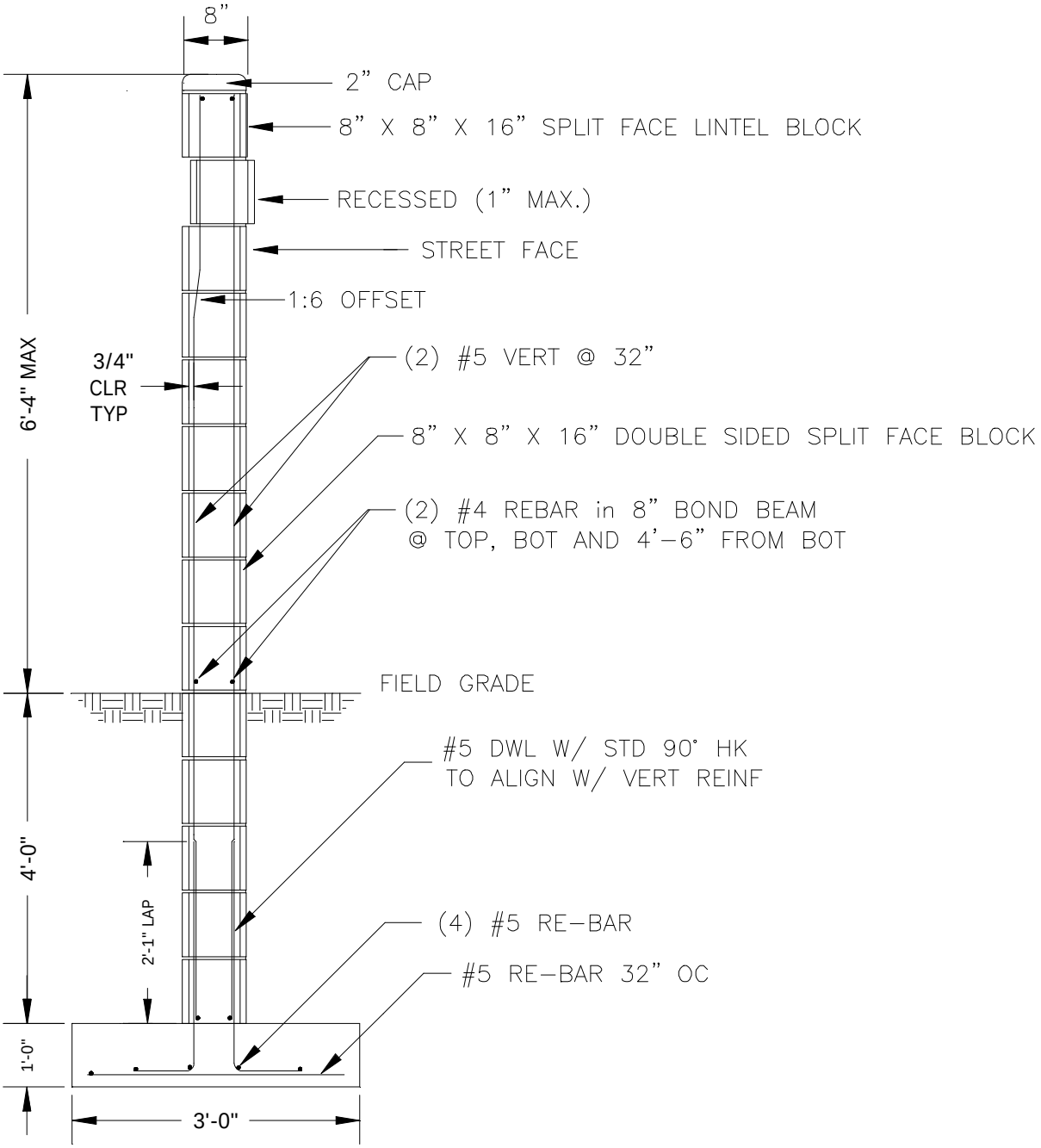
SCALE: NONE



NOTE: BOND BEAM REINF SHALL BE TERMINATED EA SIDE OF MCJ EXCEPT BOND BEAM AT TOP OF WALL WHICH SHALL BE CONTINUOUS

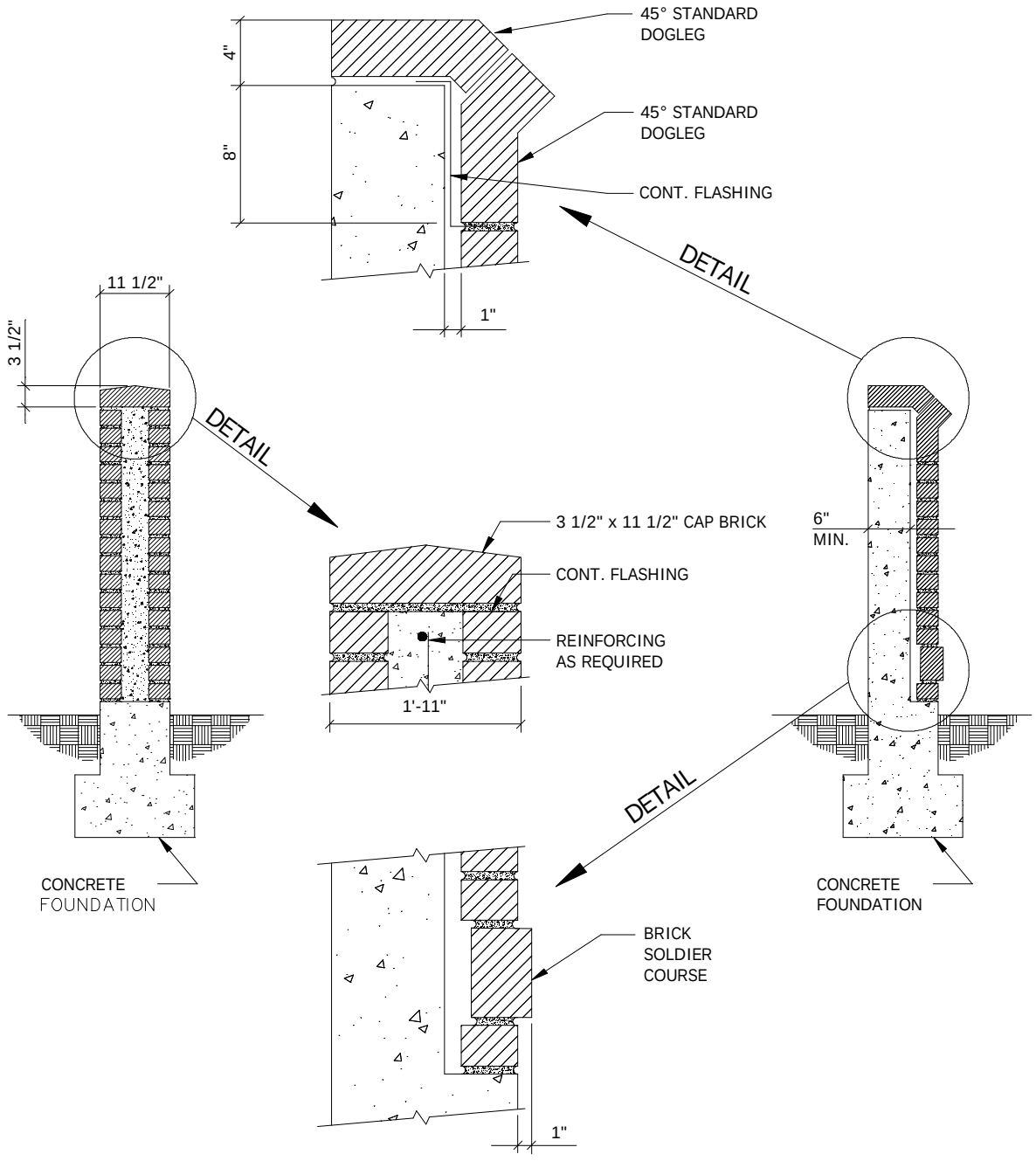
5 PLAN VIEW TYP. COLUMN

SCALE: NONE



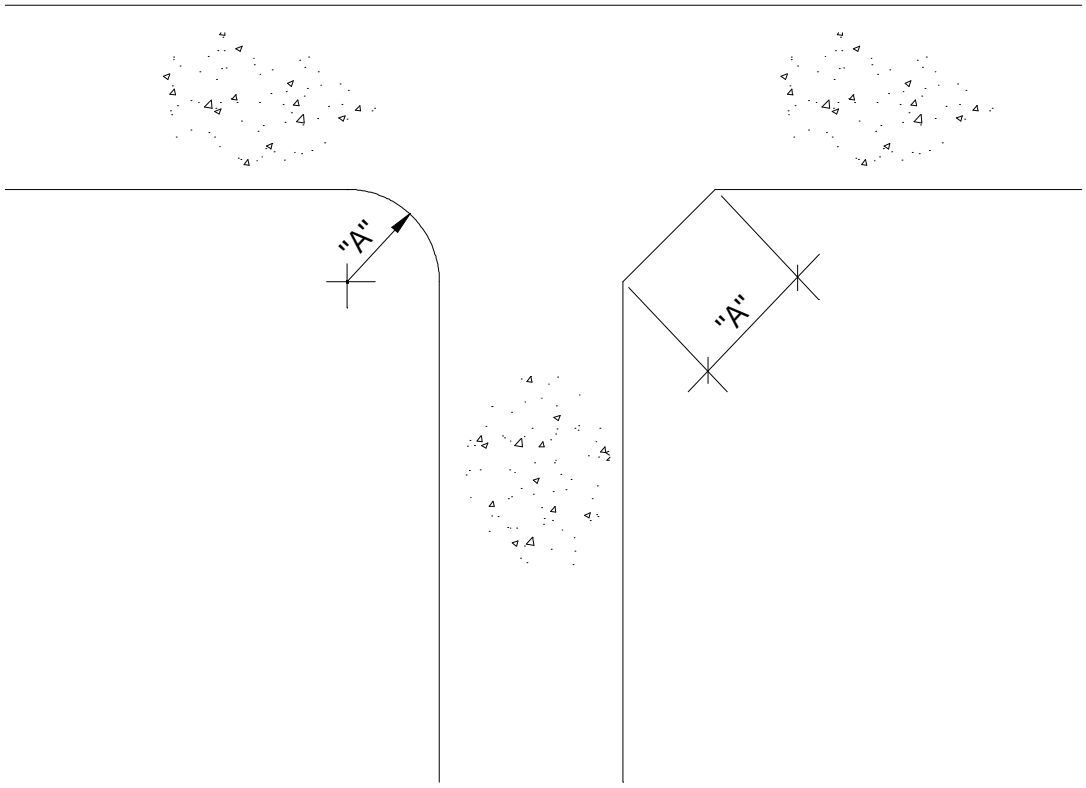
6 TYPICAL DIMENSIONS, SCREEN WALL

SCALE: NONE



7 WALL SCREEN OR ENCLOSURE (BRICK)

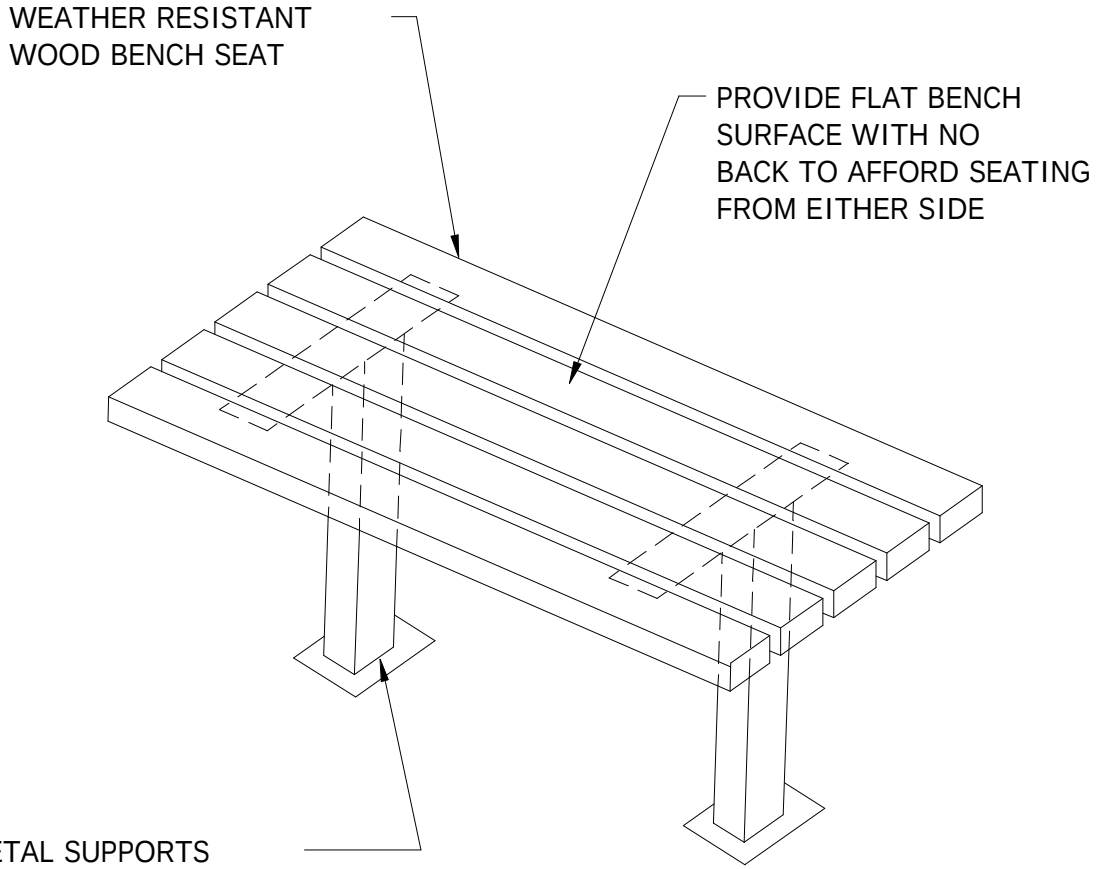
NOT TO SCALE



"A" = 3'-0" MINIMUM

8 SIDEWALK INTERSECTIONS

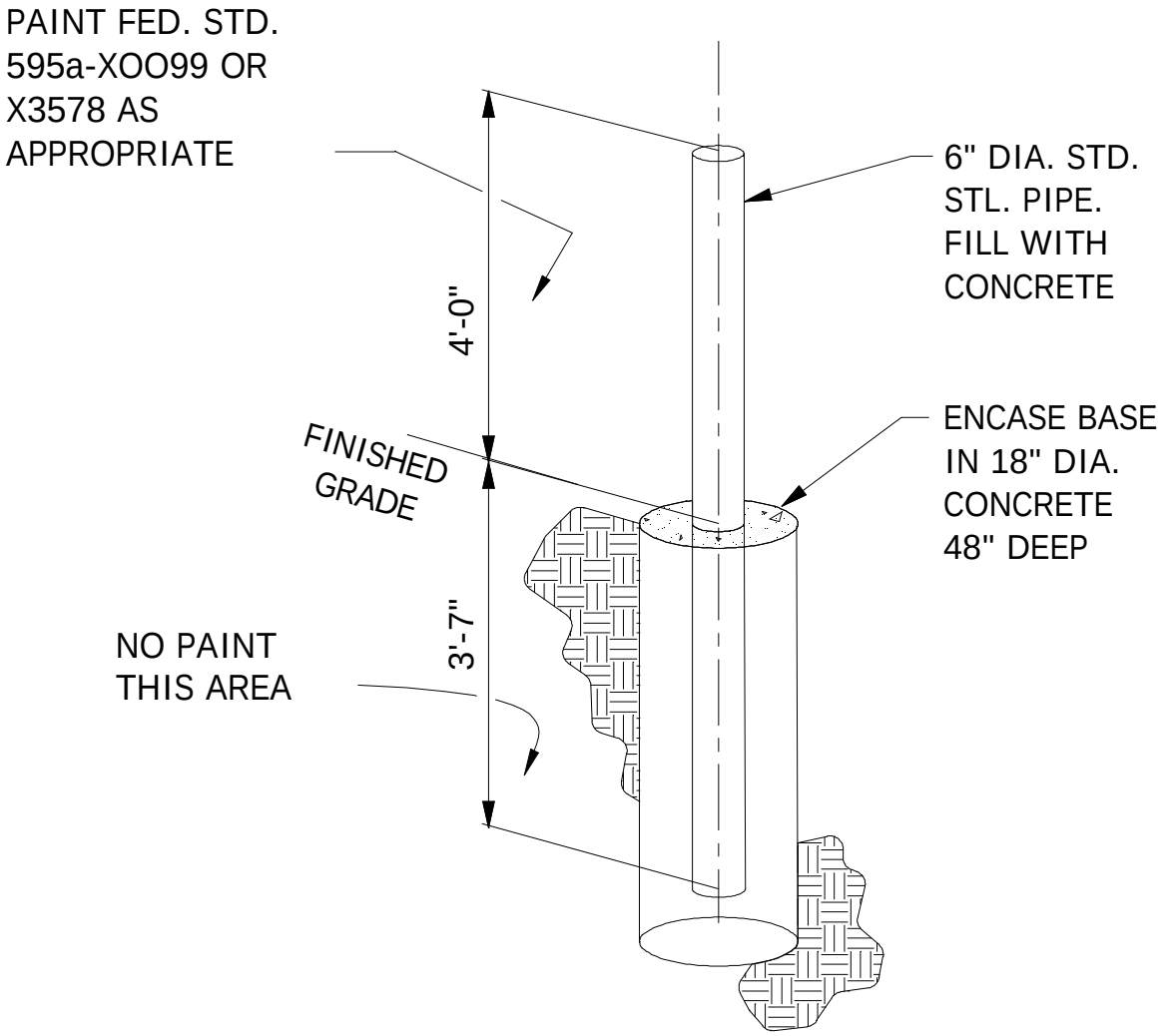
SCALE: NONE



NOTE:

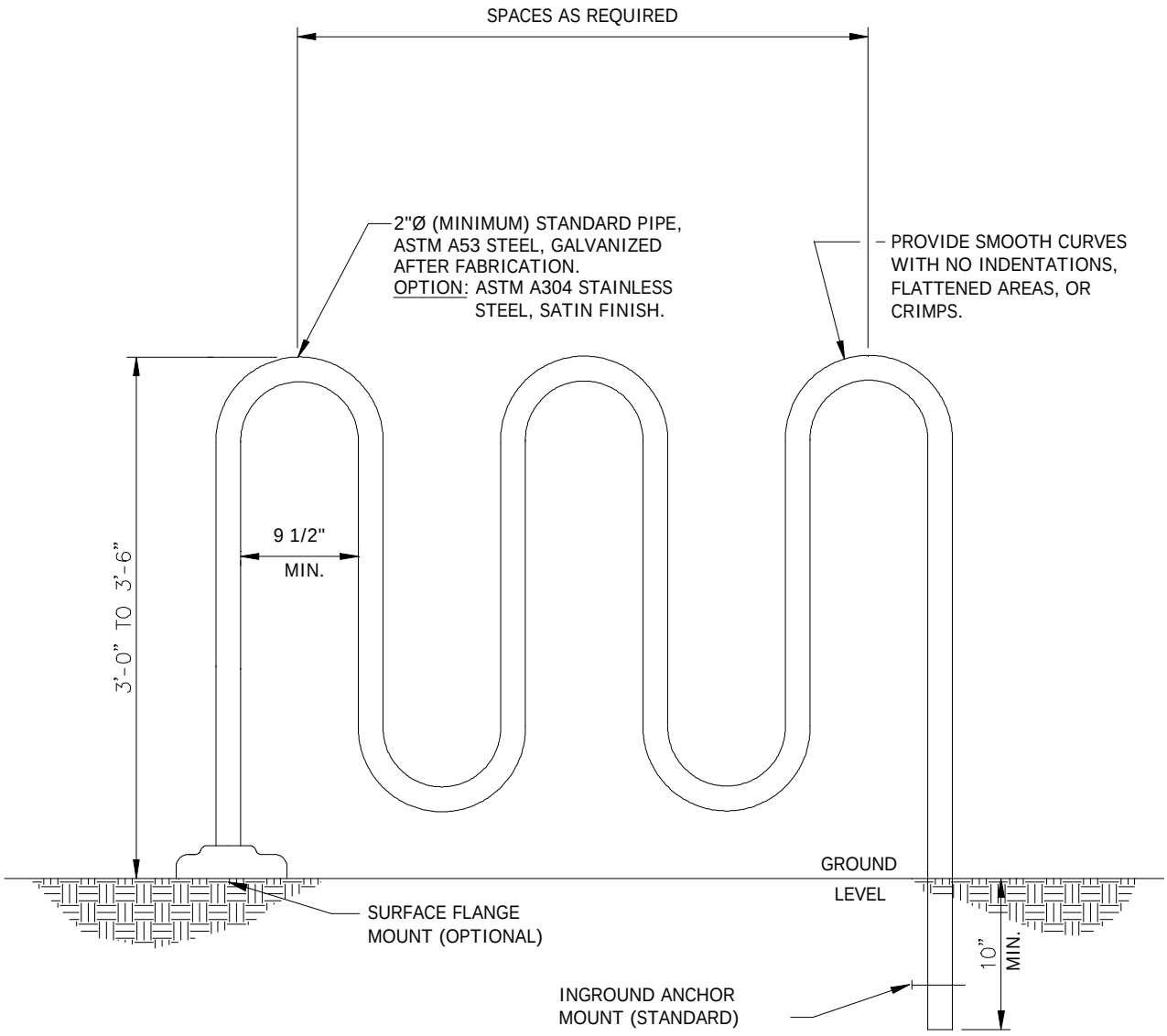
9 TYPICAL OUTDOOR BENCH

SCALE: NONE



10 BOLLARDS

SCALE: NONE



11 BIKE RACK

SCALE: NONE

DIVISION 2

SECTION 02001 - AIRFIELD SAFETY REQUIREMENTS

A. When developing specifications for this section, use the standard Fairchild Air Force Base Specifications developed by the 92d Civil Engineer Squadron Engineering Flight and edit for the specific project. See attached Specification for example.

END OF SECTION

SECTION 02001 - AIRFIELD SAFETY REQUIREMENTS

PART 1 - GENERAL

1.01 General. This section shall serve as an amendment to Section 32, paragraph 32.A.09, of the US Army Corps of Engineers Safety and Health Requirements Manual. All other requirements stipulated in the manual are to remain.

1.02 Hazardous Areas. Where pavement markings do not provide adequate definition of hazardous areas in or adjacent to an active pavement that cannot be closed to aircraft traffic, the area is outlined with markers and lights, attachment 1. At all corners and ends, dual markers and dual lights are required. A marker and a light are positioned every 50 feet (15 meters) or less between corners, and between a corner and an end. The markers may be either low- or high-profile barricades as appropriate.

a. Low-profile barricades are 1 foot (0.3 meter) or less in height, and of sufficient mass to retain an established position on pavement. Each barricade has a vertical side projection of 6 square feet (.54 square meter) or more. Projection is marked with alternating diagonal or vertical orange and white stripes at least 6 inches (150 mm) and not over 12 inches 300 mm) in width.

b. High-profile barricades are of light construction, from 2 feet (0.6 meter) to 3 feet (1 meter) in height, and anchored in their established position with sand ballast or sand bags. Each barricade has a vertical side projection of 3 square feet (0.27 square meter) or more. Projection is marked with alternating reflectorized diagonal or horizontal orange and white stripes at least 6 inches (150 mm) and not over 8 inches (200 mm) in width.

c. Each marker is provided with a continuous burning amber-yellow light of at least 10 candelas, or a flashing amber-yellow light of at least 5 candelas effective intensity. Frequency of flashing light is between 55 and 75 flashes per minute.

PART 2 - MATERIALS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

DIVISION 2

SECTION 02200 - EARTHWORK

A. When developing specifications for this section, use the standard Fairchild Air Force Base specifications developed by the 92d Civil Engineer Squadron Engineering Flight and edit for the specific project.

B Petroleum-Contaminated Soil
Refer to Section 00003 Environmental; Paragraph G.

END OF SECTION

DIVISION 2

SECTION 02525 – OTHER MATERIALS

A. When developing specifications for this section, the following sentence regarding bonding materials shall also be included in Part 3 – Execution: "Installation of Type II materials for use in bonding freshly-mixed Portland concrete to hardened concrete shall be installed in accordance with the manufacturer's recommendation."

END OF SECTION

DIVISION 2

SECTION 02900 - LANDSCAPING

A. General

1. Landscaping has an enormous impact on base appearance. The wise use of trees, shrubs and grass can create pleasant, stimulating surroundings in which to work and live. Follow guidelines in the attached Landscape Master Plan for Fairchild AFB dated February 3, 1994.

B. Screening Walls

1. Screening walls shall be provided for all dumpsters, exterior electrical/mechanical equipment, etc. Ensure sufficient clearance for maintenance access.

2. There are three types of screening walls found on Fairchild AFB. Walls located next to antique linen brick or block facilities shall be constructed of antique linen blocks per details 5 and 6, Section 02000. Screening walls located next to red bricked facilities shall be red bricked per detail 7, Section 02000. Walls located next to facilities which are antique linen in color but not of brick or block construction shall be constructed per Allen Block Corporation's mortar-less concrete block wall system. Plans and specifications can be obtained by contacting the Allen Block Corporation at 1-800-899-5309. See Section 04200, Unit Masonry, for Fairchild AFB standard colors.

C. Pesticides

1. **All** contract personnel applying pesticides must be certified by the State of Washington in the categories for the pesticides which they are applying. Contractors are responsible for ensuring their employees are certified and carry a copy of certification with them whenever on Base. Project specifications shall require certification papers to be submitted to the Contracting Officer before individuals are allowed to begin pesticide application. The required documentation shall include the applicator's full name, certification expiration date, all categories certified in, and state certification number.

2. Specifications must also include documentation needed to fulfill MAJCOM requirements, including date application was performed, application site, building number or street site, operation type (baiting, residual, etc.), labor hours/survey hours, name of the applicator, name of pest, area treated/surveyed (square feet, acres, etc.), EPA registration number, amount of finished product applied, pesticide name, percent finished product or amount of concentrate used, and finished form. Contractor Documentation Requirements data sheet is attached for inclusion in specifications involving the use of pesticides. Provide a copy of data sheet to Grounds QAE (CEOE), Pest Management, and CEV.

3. Chemical Handling

    a. Specify that contractors shall not store or mix pesticides/adjuvants on Fairchild AFB and that contractors shall not clean dispersal equipment and safety gear on Fairchild AFB.

    b. Specify that contractors shall refill sprayers/dispersal equipment at site(s) designated by the Government. Ensure that water source(s) used for mixing have a functional, state-certified backflow prevention device installed.

    c. On improved or semi-improved grounds, specify that the contractor shall post warning signs (in the areas to be treated) to the base populace to advise them that pesticides are being applied, in accordance with Washington agricultural requirements. The signs shall stay in place until the pesticide is dry, or longer if so required in the Material Safety Data Sheets or label(s) for the pesticide(s).

4. Approval of Pesticides

    a. All pesticides and adjuvants used on Fairchild AFB must be approved by all of the following authorities:

        (1) HQ AMC/ESOF, Air Mobility Command Entomologist

        (2) 92d Medical Group/BSC (Chief, Military Public Health)

        (3) 92d CES/CE (The Civil Engineer)

        (4) 92d CES/CEV (Chief, Environmental Flight)

        (5) Contracting Officer or his/her authorized representative for the contract

5. Approved Pesticide List

    a. For list of approved pesticides currently authorized for use on Fairchild AFB and tenant units, refer to AFPMB Standard Pesticide NSN Listing FY 2000 (10/1/99).

CONTRACTOR DOCUMENTATION REQUIREMENTS

Date of Application _____ Application Site _____
Operation Type _____ Building Number/Suffix _____

Street Address/Area Applied _____
Labor Hours/Survey Hours _____ Amount of Area Treated _____
Name of Pest _____ Amount of Finished Spray_____
Pesticide Registration Number _____ Percent or Ratio of Finished Spray _____
Pesticide Name _____ Amount of Concentrate Used _____
Pesticide Finished Formulation _____

Name of Applicator _____
Applicator's Certification Number _____
Certification Expiration Date _____
Categories Certified In _____
_____
_____

END OF SECTION

FAIRCHILD AIR FORCE BASE
LANDSCAPE MASTER PLAN

DECIDUOUS TREE PLANT MATRIX

			HABIT					MATURE HEIGHT				GROWTH RATE			TEXTURE					LEAF COLOR			FALL COLOR				SPECIAL CHARACTERISTICS										USES										MINIMUM PLANTING SIZE						
COMMON NAME	BOTANICAL NAME	CULTIVAR	ROUND	PYRAMIDAL	UPRIGHT	CULUMNAR	WEEPING	UNDER 20 FT	20 FT. - 35 FT.	35 FT. - 50 FT.	OVER 50 FT.	SLOW	MEDIUM	FAST	FINE	MEDIUM	COARSE	OPEN	DENSE	GREEN	YELLOW	RED/MAROON	YELLOW	RED/RUSSET	PURPLE	BROWN	FLOWERS	ORNAMENTAL FRUITS	FRAGRANT	HAS THORNS	SHADE TOLERANT	DROUGHT TOLERANT	POLLUTION TOLERANT	LOW BRANCHING	DWARF	NEEDS PROTECTION	WIDE ST./THOROUGHFARES	NARROW ST./PATHS	PARKING LOTS	PARKS/OPEN SPACES	PLAYGROUNDS	SPECIMEN USE	PLAZAS	BUILDING ENTRIES	FOUNDATION PLANTING	NATURALIZED AREAS	3 FT. - 4 FT.	4 FT. - 5 FT.	5 FT. - 6 FT.	7 FT. - 8 FT.	8 FT. - 10 FT.	1-3/4 IN. CALIPER	2 IN CALIPER
HEDGE MAPLE	ACER CAMPESTRE		·						·			·				·			·	·			·									·	·					·	·	·	·		·	·									·
VINE MAPLE	ACER CIRCINATUM				·			·				·				·			·	·				·							·			·							·		·	·	·			·					
AMUR MAPLE	ACER GINNALA	FLAME	·					·				·			·				·	·				·					·					·							·		·	·	·				·				
ROCKY MOUNTAIN MAPLE	ACER GLABRUM				·			·					·			·		·		·			·								·			·											·	·		·					
JAPANESE MAPLE	ACER PALMATUM		·					·				·			·				·	·				·							·			·		·						·	·	·	·			·					
BLOODGOOD JAPANESE MAPLE	ACER PALMATUM VAR. ATROPURPUREUM	BLOODGOOD	·					·				·			·				·	·		·		·							·			·		·						·	·	·	·			·					
CORAL-BARK JAPANESE MAPLE	ACER PALMATUM	SANGO KAKU			·			·				·			·			·		·				·							·			·		·						·	·	·	·				·				
LACELEAF JAPANESE MAPLE	ACER PALMATUM VAR. DISSECTUM ATROPURPUREUM		·					·				·			·				·			·		·							·			·		·						·	·	·	·		·						
NORWAY MAPLE	ACER PLATONOIDES		·								·		·				·		·	·			·									·	·							·	·					·							·
RED MAPLE	ACER RUBRUM			·						·			·			·			·	·				·									·				·	·	·	·	·												·
NORWEGIAN SUNSET MAPLE	ACER TRUNCATUM	NORWEGIAN SUNSET			·				·			·				·			·	·				·								·						·	·	·	·		·	·									·
PACIFIC SUNSET MAPLE	ACER TRUNCATUM	PACIFIC SUNSET	·						·			·				·			·	·				·														·	·	·	·		·	·									·
APPLE SERVICEBERRY	AMELANCHIEV X GRANDIFLORA				·				·				·		·			·		·				·			·				·									·			·	·	·	·				·			
EUROPEAN HORNBEAM	CARPINUS BETULUS	FASTIGIATA				·				·		·				·			·	·			·																						·							·	
HACKBERRY	CELTIS OCCIDEUTALIS	PRAIRIE PRIDE		·							·			·			·	·		·			·									·	·							·						·							·
FLOWERING DOGWOOD	CORNUS FLORIDA		·					·				·				·			·	·				·	·		·	·			·					·						·	·	·	·			·					
KOUSA DOGWOOD	CORNUS KOUSA		·						·			·				·			·	·				·			·	·								·						·	·	·	·			·					
TOBA HAWTHORN	CRATAEQUS X MORDENENSIS	TOBA	·					·					·			·		·		·			·				·						·							·	·		·	·	·							·	
LAVALLE HAWTHORN	CRATAEQUS X LAVALLEI		·						·				·			·			·	·				·			·	·		·			·							·				·	·							·	
WASHINGTON HAWTHORN	CRATEAQUS PHAENENOPYRUM		·						·				·			·			·	·				·			·	·	·	·			·							·				·	·							·	
EUROPEAN BEECH	FAQUS SYLVATICA			·							·	·				·			·	·				·										·						·		·											·
WHITE ASH	FRAXINUS AMERICANA	AUTUMN APPLUSE		·							·		·			·			·	·					·												·	·		·	·												·
WHITE ASH	FRAXINUS AMERICANA	AUTUMN PURPLE		·							·		·			·			·	·					·												·	·		·	·												·
GREEN ASH	FRAXINUS PENNSYLVANICA	PATMORE		·						·				·		·			·	·			·														·	·	·	·	·												·
GREEN ASH	FRAXINUS PENNSYLVANICA	SUMMIT			·					·				·		·			·	·			·														·	·	·	·	·												·
MAIDENHAIR TREE	GINKGO BILOBA	AUTUMN GOLD		·							·	·				·		·		·			·										·				·			·	·	·											·
MAIDENHAIR TREE	GINKGO BILOBA	PRINCETON SENTRY				·					·	·				·			·	·			·										·				·	·															·
HONEYLOCUST	GLEDITSIA TRIACANTHOS VAR. INERMIS	HALKA	·							·				·	·				·	·			·									·					·	·	·	·	·		·										·
HONEYLOCUST	GLEDITSIA TRIACANTHOS VAR. INERMIS	MORAINE	·							·				·	·			·		·			·									·					·	·	·	·	·	·	·										·
HONEYLOCUST	GLEDITSIA TRIACANTHOS VAR. INERMIS	SHADEMASTER		·						·				·	·			·		·			·									·					·	·	·	·	·		·										·
HONEYLOCUST	GLEDITSIA TRIACANTHOS VAR. INERMIS	SKYLINE			·					·				·	·				·	·			·									·					·	·	·	·	·		·										·
HONEYLOCUST	GLEDITSIA TRIACANTHOS VAR. INERMIS	SUNBURST	·						·				·		·			·			·		·									·						·	·	·	·		·										·
GOLDERAIN TREE	KOELREUTERIA PANICULATA		·							·			·			·			·	·			·				·					·	·					·	·	·	·	·	·	·									·
SAUCER MAGNOLIA	MAGNDIA X SOULANGIANA		·						·				·				·	·		·						·	·						·	·		·				·		·	·	·	·			·					
CANDIED APPLE CRABAPPLE	MALUS	CANDIED APPLE					·	·				·				·		·		·			·				·	·												·		·	·	·	·				·				
CHRISTMAS HOLLY CRABAPPLE	MALUS	CHRISTMAS HOLLY	·					·				·				·			·	·			·				·	·						·						·			·	·	·					·			

FAIRCHILD AIR FORCE BASE
LANDSCAPE MASTER PLAN

DECIDUOUS TREE PLANT MATRIX

			HABIT					MATURE HEIGHT				GROWTH RATE			TEXTURE					LEAF COLOR			FALL COLOR				SPECIAL CHARACTERISTICS										USES										MINIMUM PLANTING SIZE						
COMMON NAME	BOTANICAL NAME	CULTIVAR	ROUND	PYRAMIDAL	UPRIGHT	CULUMNAR	WEEPING	UNDER 20 FT	20 FT. - 35 FT.	35 FT. - 50 FT.	OVER 50 FT.	SLOW	MEDIUM	FAST	FINE	MEDIUM	COARSE	OPEN	DENSE	GREEN	YELLOW	RED/MAROON	YELLOW	RED/RUSSET	PURPLE	BROWN	FLOWERS	ORNAMENTAL FRUITS	FRAGRANT	HAS THORNS	SHADE TOLERANT	DROUGHT TOLERANT	POLLUTION TOLERANT	LOW BRANCHING	DWARF	NEEDS PROTECTION	WIDE ST./THOROUGHFARES	NARROW ST./PATHS	PARKING LOTS	PARKS/OPEN SPACES	PLAYGROUNDS	SPECIMEN USE	PLAZAS	BUILDING ENTRIES	FOUNDATION PLANTING	NATURALIZED AREAS	3 FT. - 4 FT.	4 FT. - 5 FT.	5 FT. - 6 FT.	7 FT. - 8 FT.	8 FT. - 10 FT.	1-3/4 IN. CALIPER	2 IN CALIPER
JAPANESE FLOWERING CRABAPPLE	MALUS FLORIBONDA		•						•				•			•			•	•			•				•	•												•				•								•	
JEWELBERRY CRABAPPLE	MALUS	JEWELBERRY	•					•				•				•			•	•			•				•	•							•								•	•	•				•				
MARY POTTER CRABAPPLE	MALUS	MARY POTTER	•					•				•				•			•	•			•				•	•						•						•				•	•					•			
MOLTEN LAVA CRABAPPLE	MALUS	MOLTEN LAVA					•	•				•				•		•		•			•				•	•												•		•	•	•	•					•			
ORMISTON ROY CRABAPPLE	MALUS	ORMISTON ROY	•						•				•			•			•	•			•				•	•												•				•								•	
PARAIRIEFIRE CRABAPPLE	MALUS	PRAIRIEFIRE	•					•					•			•			•			•		•			•	•												•			•	•	•						•		
RED JADE CRABAPPLE	MALUS	RED JADE					•	•					•			•			•	•			•				•	•												•		•	•	•	•					•			
ROBINSON CRABAPPLE	MALUS	ROBINSON			•				•				•			•			•	•			•				•	•												•			•	•	•							•	
SARGENT CRABAPPLE	MALUS SARGENTII		•					•				•				•			•	•			•				•	•							•								•	•	•				•				
SILVER MOON CRABAPPLE	MALUS	SILVER MOON			•			•				•				•			•	•			•				•	•												•			•	•	•						•		
SNOW DRIFT CRABAPPLE	MALUS	SNOW DRIFT	•					•					•				•		•	•			•				•	•												•			•	•	•						•		
SPRING SNOW CRABAPPLE	MALUS	SPRING SNOW			•				•				•			•			•	•			•				•													•	•		•	•	•							•	
SUGAR TYME CRABAPPLE	MALUS	SUGAR TYME			•			•				•				•			•	•			•				•	•												•			•	•	•						•		
WHITE CASCADE CRABAPPLE	MALUS	WHITE CASCADE					•	•				•				•			•	•			•				•													•		•	•	•	•					•			
LONDON PLANE TREE	PLANTANUS X ACERFOLIA			•							•		•				•		•	•						•		•					•							•	•												•
QUAKING ASPEN	POLULUS TREMULOIDES				•					•				•		•			•	•			•																	•	•					•					•		
AMUR CHOKECHERRY	PRUNUS MAACKII		•							•			•			•			•	•			•				•													•													•
EUROPEAN BIRD CHERRY	PRUNUS PADUS		•							•			•			•		•		•			•				•							•						•	•												•
SARGENT CHERRY	PRUNUS SARGENTII		•							•			•			•			•	•				•			•											•		•	•	•		•									•
COLUMNAR SARGENT CHERRY	PRUNUS SARGENTII	COLUMNARIS			•				•				•			•			•	•				•			•											•							•							•	
ACCOLADE FLOWERING CHERRY	PRUNUS SARGENTII X SUBHIRTELLA	ACCOLADE	•						•				•			•		•		•				•			•													•	•	•	•	•	•							•	
SHIROFUGEN FLOWERING CHERRY	PRUNUS SERRILATA	SHIROGUGEN	•						•				•			•			•	•				•			•													•	•	•	•	•								•	
AUTUMN FLOWERING CHERRY	PRUNUS SUBHIRTELLA VAR. AUTUMNALIS		•						•				•			•			•	•			•				•							•						•	•	•	•	•								•	
YOSHINO CHERRY	PRUNUS X YEDOENSIS		•							•				•		•			•	•			•				•													•	•	•	•	•									•
AKEBORO CHERRY	PRUNUS X YEDOENSIS	AKEBORO	•						•				•			•			•	•			•				•													•	•	•	•	•								•	
SNOW FOUNTAIN FLOWERING CHERRY	PRUNUS X YEDOENSIS	SNOW FOUNTAIN					•	•				•				•		•		•			•	•			•													•		•	•	•	•				•				
ARISTOCRAT FLOWERING PEAR	PYRUS CALLERYANA	ARISTOCRAT		•					•				•			•			•	•			•	•			•					•	•					•	•	•	•		•	•									•
CHANTICLEER FLOWERING PEAR	PYRUS CALLERYANA	CHANTICLEER			•				•				•			•			•	•				•	•		•					•	•					•	•	•	•		•	•	•								•
CLEVELAND SELECT FLOWERING PEAR	PYRUS CALLERYANA	CLEVELAND SELECT			•				•				•			•			•	•				•	•		•					•	•					•	•	•	•		•	•	•								•
RESPIRE FLOWERING PEAR	PYRUS CALLERYANA	REDSPIRE		•					•				•			•			•	•				•			•					•	•					•	•	•	•		•	•									•
SCARLET OAK	QUERCUS COCCINEA			•							•		•			•		•		•				•													•	•		•	•												•
PIN OAK	QUERCUS PALUSTRIS			•							•		•			•		•		•				•													•	•		•	•												•
COLUMNAR ENGLISH OAK	QUERCUS ROBUR	FASTIGIATA				•				•		•				•			•	•						•												•		•	•				•							•	
RED OAK	QUERCUS RUBRA		•								•		•			•			•	•				•									•				•			•	•												•
PURPLE ROBE LOCUST	ROBINA PSEUDOACACIA	PURPLE ROBE	•							•			•			•			•	•			•				•		•			•								•						•							•
KOREAN MOUNTAIN ASH	SORBUS ALNIFOLIA			•						•			•			•			•	•			•			•	•	•												•				•									•

FAIRCHILD AIR FORCE BASE
LANDSCAPE MASTER PLAN

DECIDUOUS TREE PLANT MATRIX

COMMON NAME	BOTANICAL NAME	CULTIVAR	HABIT: ROUND	HABIT: PYRAMIDAL	HABIT: UPRIGHT	HABIT: CULUMNAR	HABIT: WEEPING	MATURE HEIGHT: UNDER 20 FT	MATURE HEIGHT: 20 FT. - 35 FT.	MATURE HEIGHT: 35 FT. - 50 FT.	MATURE HEIGHT: OVER 50 FT.	GROWTH RATE: SLOW	GROWTH RATE: MEDIUM	GROWTH RATE: FAST	TEXTURE: FINE	TEXTURE: MEDIUM	TEXTURE: COARSE	TEXTURE: OPEN	TEXTURE: DENSE
BLACK HAWK MOUNTAIN ASH	SORBUS AUCUPARIA	BLACK HAWK				•			•				•			•			•
CARDINAL ROYAL MOUNTAIN ASH	SORBUS AUCUPARIA	CARDINAL ROYAL			•				•				•			•			•
JAPANESE TREE LILAC	SYRINGA RETICULATA		•						•				•			•			•
REDMOND LINDEN	TILIA AMERICANA	REDMOND		•							•		•				•		•
GREENSPIRE LINDEN	TILIA CORDATA	GREENSPIRE		•						•			•			•			•
SALEM LINDEN	TILIA CORDATA	SALEM	•						•				•			•			•
SILVER LINDEN	TILIA TOMENTOSA			•							•		•			•			•
GREEN VASE ZELKOVA	ZELKOVA SERRATA	GREEN VASE	•								•		•			•			•
VILLAGE GREEN ZELKOVA	ZELKOVA SERRATA	VILLAGE GREEN	•								•			•		•			

COMMON NAME	LEAF COLOR: GREEN	LEAF COLOR: YELLOW	LEAF COLOR: RED/MAROON	FALL COLOR: YELLOW	FALL COLOR: RED/RUSSET	FALL COLOR: PURPLE	FALL COLOR: BROWN	SPECIAL: FLOWERS	SPECIAL: ORNAMENTAL FRUITS	SPECIAL: FRAGRANT	SPECIAL: HAS THORNS	SPECIAL: SHADE TOLERANT	SPECIAL: DROUGHT TOLERANT	SPECIAL: POLLUTION TOLERANT	SPECIAL: LOW BRANCHING	SPECIAL: DWARF	SPECIAL: NEEDS PROTECTION
BLACK HAWK MOUNTAIN ASH	•				•			•	•								
CARDINAL ROYAL MOUNTAIN ASH	•				•			•	•								
JAPANESE TREE LILAC	•							•		•							
REDMOND LINDEN	•			•				•		•							
GREENSPIRE LINDEN	•			•				•		•				•			
SALEM LINDEN	•			•				•		•				•			
SILVER LINDEN	•			•				•		•				•			
GREEN VASE ZELKOVA	•				•								•	•	•		
VILLAGE GREEN ZELKOVA	•				•								•	•	•		

COMMON NAME	USES: WIDE ST./THOROUGHFARES	USES: NARROW ST./PATHS	USES: PARKING LOTS	USES: PARKS/OPEN SPACES	USES: PLAYGROUNDS	USES: SPECIMEN USE	USES: PLAZAS	USES: BUILDING ENTRIES	USES: FOUNDATION PLANTING	USES: NATURALIZED AREAS	MIN. SIZE: 3 FT. - 4 FT.	MIN. SIZE: 4 FT. - 5 FT.	MIN. SIZE: 5 FT. - 6 FT.	MIN. SIZE: 7 FT. - 8 FT.	MIN. SIZE: 8 FT. - 10 FT.	MIN. SIZE: 1-3/4 IN. CALIPER	MIN. SIZE: 2 IN CALIPER
BLACK HAWK MOUNTAIN ASH				•				•	•								•
CARDINAL ROYAL MOUNTAIN ASH				•				•									•
JAPANESE TREE LILAC		•	•	•	•	•	•	•	•					•			
REDMOND LINDEN	•			•													•
GREENSPIRE LINDEN	•	•	•	•			•	•									•
SALEM LINDEN		•	•	•			•	•									•
SILVER LINDEN	•	•		•													•
GREEN VASE ZELKOVA	•	•		•	•												•
VILLAGE GREEN ZELKOVA	•	•		•	•												•

FAIRCHILD AIR FORCE BASE
LANDSCAPE MASTER PLAN

CONIFEROUS TREE PLANT MATRIX

			HABIT			MATURE HEIGHT			GROWTH RATE			TEXTURE					LEAF COLOR			SPECIAL CHARACTERISTICS						USES												MINIMUM PLANTING SIZE		
COMMON NAME	BOTANICAL NAME	CULTIVAR	BROADLY CONICAL	NARROWLY CONICAL	COLUMNAR	UNDER 25 FT	25 FT. - 60 FT.	OVER 60 FT.	SLOW	MEDIUM	FAST	FINE	MEDIUM	COARSE	OPEN	DENSE	GREEN	BLUE - GREEN	SILVER - BLUE	SHADE TOLERANT	DROUGHT TOLERANT	POLLUTION TOLERANT	LOW BRANCHING	DWARF	NEEDS PROTECTION	WIDE ST./THOROUGHFARES	NARROW ST./PATHS	PARKING LOTS	PARKS/OPEN SPACES	PLAYGROUNDS	SPECIMEN USE	PLAZAS	BUILDING ENTRIES	FOUNDATION PLANTING	SCREENS	WINDBREAKS	NATURALIZED AREAS	3 FT. - 4 FT.	4 FT. - 5 FT.	5 FT. - 6 FT.
ALPINE FIR	ABIES LASIOCARPA			·		·			·				·			·		·						·			·	·	·	·		·	·	·				·		
CORK FIR	ABIES LASIOCARPA VAR ARIZONICA			·		·			·				·			·			·					·			·	·	·	·	·	·	·	·				·		
NORWAY SPRUCE	PICEA ABIES		·				·			·			·			·	·												·	·					·	·				·
BLACK HILLS SPRUCE	PICEA GLAUCA VAR. DENSATA			·			·		·				·			·	·				·						·		·	·		·			·	·	·			·
SERBIAN SPRUCE	PICEA OMORIKA			·			·		·				·			·	·			·					·	·	·		·	·	·				·					·
COLORADO SPRUCE	PICEA PUNGENS		·					·		·			·			·	·	·								·			·	·					·	·				·
COLORADO BLUE SPRUCE	PICEA PUNGENS VAR. GLAUCA		·					·		·			·			·			·							·			·	·	·				·	·				·
BRISTLECONE PINE	PINUS ARISTATA			·		·			·				·			·	·						·								·	·	·	·				·		
JACK PINE	PINUS BANKSIANA		·				·			·			·		·		·				·															·	·			·
AUSTRAIN PINE	PINUS NIGRA VAR. AUSTRIACA		·					·		·				·		·	·					·				·			·	·					·	·				·
PONDEROSA PINE	PINUS PONDEROSA			·				·		·				·	·		·				·															·	·			·
SCOTCH PINE	PINUS SYLVESTRIS		·				·			·			·		·		·				·								·	·					·	·	·			·
COLUMNAR SCOTCH PINE	PINUS SYLVESTRIS	FASTIGIATA			·	·				·			·			·	·								·									·					·	
MOUNTAIN HEMLOCK	TSUGA MERTENSIANA			·		·			·			·				·		·		·				·	·		·	·	·	·		·	·	·	·				·	

FAIRCHILD AIR FORCE BASE
LANDSCAPE MASTER PLAN

SHRUB PLANT MATRIX

COMMON NAME	BOTANICAL NAME	CULTIVAR	HABIT							MATURE HEIGHT					MATURE SPREAD			
			PROSTRATE	SPREADING	ROUNDED	PYRAMIDAL	UPGRIGHT	COLUMNAR	VINING/CLIMBING	UNDER 1 FT.	1 FT. - 3 FT.	3 FT. - 6 FT.	6 FT. - 10 FT.	OVER 10 FT.	UNDER 3 FT.	3 FT. - 6 FT.	6 FT. - 10 FT.	OVER 10 FT.
KOREAN BARBERRY	BERBERIS KOREANA				•							•				•		
MENTOR BARBERRY	BERBERIS X MENTORENSIS				•							•				•		
CRIMSON PIGMY BARBERRY	BERBERIS THUNBERGII VAR. ATROPURPUREA	CRIMSON PIGMY		•							•				•			
ROSE GLOW BARBERRY	BERBERIS THUNBERGII VAR. ATROPURPUREA	ROSE GLOW			•							•				•		
GOLD JAPANESE BARBERRY	BERBERIS THUNBERGII	AUREA			•						•				•			
KOBOLD BARBERRY	BERBERIS THUNBERGII	KOBOLD			•						•				•			
WINTER GEM BOX WOOD	BUXUS MICROPHYLIA VAR. KOREANA	WINTER GEM			•						•				•			
TATARIAN DOGWOOD	CORNUS ALBA	SIBIRICA					•						•				•	
CORNELIAN CHERRY	CORNUS MAS				•									•				•
REDOSIER DOGWOOD	CORNUS SERICEA				•								•				•	
YELLOW STEM DOGWOOD	CORNUS SERICEA	FLAVIRAMEA			•								•				•	
KELSEY DOGWOOD	CORNUS SERICEA	KELSEY			•						•				•			
SMOKETREE	CONTINUS COGGYGRIA	ROYAL PURPLE					•							•			•	
CRANBERRY COTONEASTER	COTONEASTER APICULATUS			•							•					•		
SPREADING COTONEASTER	COTONEASTER DIVARICATUS			•								•					•	
ROCK COTONEASTER	COTONEASTER HORIZONTALIS			•							•						•	
HEDGE COTONEASTER	COTONEASTER LUCIDUS						•						•				•	
BURNING BUSH	EUONYMUS ALATUS				•									•				•
DWARF BURNING BUSH	EUONYMUS ALATUS	COMPACTUS			•							•				•		
EMERALD GAIETY WINTERCREEPER	EUONYMUS FORTUNEI	EMERALD GAIETY					•		•			•			•			
EMERALD 'N GOLD WINTERCREEPER	EUONYMUS FORTUNEI	EMERALD 'N GOLD			•						•				•			
BIGLEAF WINTERCREEPER	EUONYMUS FORTUNEI	VEGETUS					•		•					•		•		
BORDER FORSYTHIA	FORSYTHIA X INTERMDIA						•							•				•
SUNRISE FORSYTHIA	FORSYTHIA OVATA	SUNRISE			•							•				•		
SUNBURST ST. JOHNSWORT	HYPERICUM FRONDOSUM	SUNBURST			•						•				•			
GOLD COAST JUNIPER	JUNIPERUS CHINENSIS	GOLD COAST		•							•					•		
HOLLYWOOD JUNIPER	JUNIPERUS CHINENSIS	TORULOSA					•							•		•		
MINT JULEP JUNIPER	JUNIPERUS CHINENSIS	MINT JULEP		•								•				•		
OLD GOLD JUNIPER	JUNIPERUS CHINENSIS	OLD GOLD		•							•					•		
PFITZER JUNIPER	JUNIPERUS CHINENSIS	PFITZERIANA		•								•					•	
GOLD PFITZER JUNIPER	JUNIPERUS CHINENSIS	PFITZERIANA AUREA		•							•					•		
COMPACT PFITZER	JUNIPERUS CHINENSIS	PFITZERIANA COMPACTA		•							•					•		
BLUE PFITZER JUNIPER	JUNIPERUS CHINENSIS	PFITZERIANA GLAUCA		•								•					•	
ROBUSTA GREEN JUNIPER	JUNIPERUS CHINENSIS	ROBUSTA GREEN					•							•		•		
SARGENT JUNIPER	JUNIPERUS CHINENSIS VAR. SARGENTII			•							•						•	
SPARTAN JUNIPER	JUNIPERUS CHINENSIS	SPARTAN						•						•	•			
BAR HARBOR JUNIPER	JUNIPERUS HORIZONTALIS	BAR HARBOR	•							•							•	
BLUE CHIP JUNIPER	JUNIPERUS HORIZONTALIS	BLUE CHIP	•							•							•	
EMERALD SPREADER JUNIPER	JUNIPERUS HORIZONTALIS	EMERALD SPREADER	•							•							•	
TURQUOISE SPREADER JUNIPER	JUNIPERUS HORIZONTALIS	TURQUOISE SPREADER	•							•							•	

COMMON NAME	GROWTH RATE			LEAF TYPE			TEXTURE					LEAV COLOR					
	SLOW	MEDIUM	FAST	DECIDUOUS	NEEDLELEAF EVERGR.	BROADLEAF EVERGR.	FINE	MEDIUM	COARSE	OPEN	DENSE	GREEN / BLUE - GREEN	YELLOW	RED / MAROON	PURPLE	SILVER BLUE	VARIEGATED
KOREAN BARBERRY		•		•				•			•	•					
MENTOR BARBERRY			•	•				•			•	•					
CRIMSON PIGMY BARBERRY	•			•				•			•			•			
ROSE GLOW BARBERRY		•		•				•			•			•	•		
GOLD JAPANESE BARBERRY	•			•				•			•		•				
KOBOLD BARBERRY	•			•				•			•	•					
WINTER GEM BOX WOOD	•					•	•				•	•					
TATARIAN DOGWOOD			•	•				•		•		•					
CORNELIAN CHERRY		•		•				•			•	•					
REDOSIER DOGWOOD			•	•				•		•		•					
YELLOW STEM DOGWOOD			•	•				•		•		•					
KELSEY DOGWOOD		•		•				•			•	•					
SMOKETREE		•		•				•		•					•		
CRANBERRY COTONEASTER	•			•			•				•	•					
SPREADING COTONEASTER			•	•			•			•		•					
ROCK COTONEASTER		•		•			•				•	•					
HEDGE COTONEASTER		•		•				•			•	•					
BURNING BUSH	•			•				•			•	•					
DWARF BURNING BUSH	•			•				•			•	•					
EMERALD GAIETY WINTERCREEPER		•				•		•			•						•
EMERALD 'N GOLD WINTERCREEPER	•					•		•			•						•
BIGLEAF WINTERCREEPER			•			•		•			•	•					
BORDER FORSYTHIA			•	•				•		•		•					
SUNRISE FORSYTHIA		•		•				•			•	•					
SUNBURST ST. JOHNSWORT	•			•				•			•	•					
GOLD COAST JUNIPER	•				•			•			•		•				
HOLLYWOOD JUNIPER		•			•			•			•	•					
MINT JULEP JUNIPER	•				•			•			•	•					
OLD GOLD JUNIPER	•				•			•			•		•				
PFITZER JUNIPER		•			•			•			•	•					
GOLD PFITZER JUNIPER		•			•			•			•	•	•				
COMPACT PFITZER	•				•			•			•	•					
BLUE PFITZER JUNIPER		•			•			•			•					•	
ROBUSTA GREEN JUNIPER	•				•			•			•	•					
SARGENT JUNIPER	•				•			•			•	•					
SPARTAN JUNIPER		•			•			•			•	•					
BAR HARBOR JUNIPER		•			•			•			•	•					
BLUE CHIP JUNIPER		•			•			•			•					•	
EMERALD SPREADER JUNIPER		•			•			•		•		•					
TURQUOISE SPREADER JUNIPER		•			•			•			•	•					

COMMON NAME	FALL COLOR				FLOWER COLOR				GROWTH REQUIREMENTS						
	YELLOW	RED / RUSSET	PURPLE	BROWN	WHITE	YELLOW / ORAGE	PINK / RED	BLUE / PURPLE	SUN	PART SHADE	FULL SHADE	WELL DRAINED SOILS	RICH MOIST SOILS	ACID SOILS	WIND PROTECTION
KOREAN BARBERRY		•							•	•		•			
MENTOR BARBERRY	•	•							•	•		•			
CRIMSON PIGMY BARBERRY		•							•	•		•			
ROSE GLOW BARBERRY		•							•	•		•			
GOLD JAPANESE BARBERRY		•							•	•		•			
KOBOLD BARBERRY	•								•	•		•			
WINTER GEM BOX WOOD									•	•	•		•		•
TATARIAN DOGWOOD		•	•		•				•	•		•			
CORNELIAN CHERRY			•			•			•	•		•			
REDOSIER DOGWOOD		•			•				•	•			•		
YELLOW STEM DOGWOOD		•			•				•	•			•		
KELSEY DOGWOOD		•							•	•			•		
SMOKETREE			•				•		•			•			
CRANBERRY COTONEASTER		•							•	•		•			
SPREADING COTONEASTER		•							•	•		•			
ROCK COTONEASTER		•							•	•		•			
HEDGE COTONEASTER	•	•							•	•		•			
BURNING BUSH		•							•	•	•	•			
DWARF BURNING BUSH		•							•	•	•	•			
EMERALD GAIETY WINTERCREEPER									•	•	•				
EMERALD 'N GOLD WINTERCREEPER									•	•	•				
BIGLEAF WINTERCREEPER									•	•	•				
BORDER FORSYTHIA	•					•			•						
SUNRISE FORSYTHIA	•					•			•						
SUNBURST ST. JOHNSWORT						•			•	•					
GOLD COAST JUNIPER									•	•		•			
HOLLYWOOD JUNIPER									•	•		•			
MINT JULEP JUNIPER									•	•		•			
OLD GOLD JUNIPER									•	•		•			
PFITZER JUNIPER									•	•		•			
GOLD PFITZER JUNIPER									•	•		•			
COMPACT PFITZER									•	•		•			
BLUE PFITZER JUNIPER									•	•		•			
ROBUSTA GREEN JUNIPER									•	•		•			
SARGENT JUNIPER									•	•		•			
SPARTAN JUNIPER									•	•		•			
BAR HARBOR JUNIPER									•	•		•			
BLUE CHIP JUNIPER									•	•		•			
EMERALD SPREADER JUNIPER									•	•		•			
TURQUOISE SPREADER JUNIPER									•	•		•			

COMMON NAME	SPECIAL CHAR.						USES													MINIMUM PLANTING SIZE					
	FLOWERS	FRUITS	FRAGRANT	DROUGHT TOLERANT	HAS THORNS	RED / YELLOW STEMS	SPECIMENT USE	GROUND COVER	BORDER	LOW SCREEN	HEDGE / TALL SCREEN	BARRIER PLANTING	PARKING LOTS	PARKS / OPEN SPACES	PLAYGROUNDS	PLAZAS	BUILDING ENTRIES	FOUND. PLANTING	NATURALIZED AREAS	12 IN. - 15 IN.	15 IN. - 18 IN.	18 IN. - 24 IN.	24 IN. - 30 IN.	30 IN. - 36 IN.	3 FT. - 24 FT.
KOREAN BARBERRY		•			•							•	•	•			•	•			•				
MENTOR BARBERRY					•						•	•		•				•				•			
CRIMSON PIGMY BARBERRY		•			•				•							•	•	•		•					
ROSE GLOW BARBERRY		•			•							•	•	•			•	•			•				
GOLD JAPANESE BARBERRY					•					•			•	•		•	•	•			•				
KOBOLD BARBERRY					•				•	•			•	•		•	•	•		•					
WINTER GEM BOX WOOD									•	•						•	•	•			•				
TATARIAN DOGWOOD	•					•					•			•					•				•		
CORNELIAN CHERRY	•	•									•			•				•						•	
REDOSIER DOGWOOD	•					•					•			•				•				•			
YELLOW STEM DOGWOOD	•					•					•			•				•				•			
KELSEY DOGWOOD	•								•	•			•	•		•	•	•			•				
SMOKETREE	•			•										•	•			•						•	
CRANBERRY COTONEASTER		•		•				•	•					•		•	•	•			•				
SPREADING COTONEASTER		•									•			•				•				•			
ROCK COTONEASTER		•						•	•	•			•	•		•	•	•			•				
HEDGE COTONEASTER											•			•				•					•		
BURNING BUSH							•				•			•	•	•	•	•						•	
DWARF BURNING BUSH											•		•	•	•	•	•	•				•			
EMERALD GAIETY WINTERCREEPER										•				•	•	•	•	•			•				
EMERALD 'N GOLD WINTERCREEPER									•	•			•	•		•	•	•		•					
BIGLEAF WINTERCREEPER		•												•	•	•	•	•			•				
BORDER FORSYTHIA	•										•			•	•			•					•		
SUNRISE FORSYTHIA	•										•			•	•			•				•			
SUNBURST ST. JOHNSWORT	•			•					•	•			•	•	•	•	•	•			•				
GOLD COAST JUNIPER									•	•			•	•	•	•	•	•				•			
HOLLYWOOD JUNIPER							•									•	•	•						•	
MINT JULEP JUNIPER										•		•	•	•	•		•	•				•			
OLD GOLD JUNIPER										•			•	•	•	•	•	•				•			
PFITZER JUNIPER											•	•		•	•			•					•		
GOLD PFITZER JUNIPER									•	•			•	•	•	•	•	•				•			
COMPACT PFITZER									•	•			•	•	•	•	•	•				•			
BLUE PFITZER JUNIPER											•	•		•	•			•					•		
ROBUSTA GREEN JUNIPER											•			•	•		•	•							•
SARGENT JUNIPER								•	•				•	•	•	•	•	•				•			
SPARTAN JUNIPER											•			•	•			•							•
BAR HARBOR JUNIPER				•				•	•				•	•	•	•	•	•				•			
BLUE CHIP JUNIPER				•				•	•				•	•	•	•	•	•				•			
EMERALD SPREADER JUNIPER				•				•					•	•	•	•	•	•				•			
TURQUOISE SPREADER JUNIPER				•				•	•				•	•	•	•	•	•				•			

FAIRCHILD AIR FORCE BASE
LANDSCAPE MASTER PLAN

SHRUB PLANT MATRIX

COMMON NAME	BOTANICAL NAME	CULTIVAR	HABIT: PROSTRATE	SPREADING	ROUNDED	PYRAMIDAL	UPRIGHT	COLUMNAR	VINING/CLIMBING	MATURE HEIGHT: UNDER 1 FT.	1 FT. - 3 FT.	3 FT. - 6 FT.	6 FT. - 10 FT.	OVER 10 FT.	MATURE SPREAD: UNDER 3 FT.	3 FT. - 6 FT.	6 FT. - 10 FT.	OVER 10 FT.	GROWTH RATE: SLOW	MEDIUM	FAST	LEAF TYPE: DECIDUOUS	NEEDLELEAF EVERGR.	BROADLEAF EVERGR.
BLUE RUG JUNIPER	JUNIPERUS HORIZONTALIS	WILTON	•							•							•			•			•	
DWARF JAPGARDEN	JUNIPERUS PROCUMBENS	NANA	•							•							•		•				•	
BROADMOOR JUNIPER	JUNIPERUS SABINA	BROADMOOR		•							•						•		•				•	
BUFFALO JUNIPER	JUNIPERUS SABINA	BUFFALO	•							•							•		•				•	
TAM JUNIPER	JUNIPERUS SABINA VAR. TAMARISCIFOLIA			•							•							•	•				•	
TABLE TOP JUNIPER	JUNIPERUS SCOPULORUM	TABLE TOP		•			•					•					•		•				•	
WICHITA BLUE JUNIPER	JUNIPERUS SCOPULORUM	WICHITA BLUE				•								•		•			•				•	
MOUNTAIN LAUREL	KALMIA LATIFOLIA				•								•				•		•					•
JAPANESE KERRIA	KERRIA JAPONICA						•					•					•			•		•		
GOLDEN VICARY PRIVET	LIGUSTRUM X VICARYI						•							•			•				•	•		
COMMON PRIVET	LIGUSTRUM VULGARE						•							•			•				•	•		
STAR MAGNOLIA	MAGNOLIA STELLATA				•								•				•		•			•		
OREGON HOLLYGRAPE	MAHONIA AQUIFOLIUM						•					•				•			•					•
DWARF OREGON HOLLYGRAPE	MAHONIA AQUIFOLIUM	COMPACTUM			•						•				•				•					•
GLACIER MOCKORANGE	PHILADELPHUS X VIRGINALIS	GLACIER			•							•				•				•		•		
MINNESOTA SNOWFLAKE MOCKORANGE	PHILADELPHUS X VIRGINALIS	MINNESOTA SNOWFLAKE			•								•				•				•	•		
MINIATURE SNOWFLAKE MOCKORANGE	PHILADELPHUS	MINIATURE SNOWFLAKE			•						•				•					•		•		
DART'S GOLDEN NINEBARK	PHYSOCARPUS OPULIFOLIUS	DART'S GOLDEN			•							•				•				•		•		
MAXWELL SPRUCE	PICEA ABIES	MAXWELLII			•						•					•			•				•	
BIRD'S NEST SPRUCE	PICEA ABIES	NIDIFORMIS		•							•					•				•			•	
GLOBE BLUE SPRUCE	PICEA PUNGENS	GLAUCA GLOBOSA		•							•					•			•				•	
MUGO PINE	PINUS MUGO VAR. MUGO			•									•					•	•				•	
DWARF MUGO PINE	PINUS MUGO VAR. PUMILIO			•							•					•			•				•	
BUSH CINQUEFOIL	POTENTILLA FRUTICOSA				•						•				•				•			•		
OTTO LUYKEN LAUREL	PRUNUS LAUROCERASUS	OTTO LUYKEN		•							•					•				•				•
SCHIPKA LAUREL	PRUNUS LAUROCERASUS	SCHIPKAENSIS		•								•					•			•				•
YUKON BELLE FIRETHORN	PYRACANTHA ANGUSTIFOLIA	YUKON BELLE					•						•			•				•				•
CATAWBA RHODODENRON	RHODODENDRON CATAWBIENSE				•								•			•			•					•
EXBURY AZALEA	RHODODENDRON 'EXBURY/KNAP HILL'						•						•			•			•			•		
WILSON RHODODENDRON	RHODODENDRON X LAETEVIRENS			•							•					•			•					•
NORTHERN LIGHTS AZALEA	RHODODENDRON 'NORTHERN LIGHTS'				•							•				•			•			•		
PJM RHODODENDRON	RHODODENDRON 'PJM'				•							•				•			•					•
RAMPO RHODOENDRON	RHODODENDRON RAMAPO				•						•				•				•					•
FRAGRANT SUMAC	RHUS AROMATICA	GRO-LOW		•							•						•			•		•		
STAGHORN SUMAC	RHUS TYPHINA						•							•			•				•	•		
FERNLEAF STAGHORN SUMAC	RHUS TYPHINA	LACINIATA					•						•			•					•	•		
ALPINE CURRENT	RIBES ALPINUM				•							•				•				•		•		
GOLDEN CURRENT	RIBES ALPINUM	AUREUM			•						•				•				•					
JAPNESE WHITE SPIREA	SPIREA ALBIFLORA				•						•				•					•		•		
CRISPLEAF SPIREA	SPIREA BULLATA				•					•					•				•			•		

COMMON NAME	TEXTURE: FINE	MEDIUM	COARSE	OPEN	DENSE	LEAV COLOR: GREEN / BLUE - GREEN	YELLOW	RED / MAROON	PURPLE	SILVER BLUE	VARIEGATED	FALL COLOR: YELLOW	RED / RUSSET	PURPLE	BROWN	FLOWER COLOR: WHITE	YELLOW / ORAGE	PINK / RED	BLUE / PURPLE
BLUE RUG JUNIPER		•			•					•									
DWARF JAPGARDEN	•				•	•													
BROADMOOR JUNIPER		•			•	•													
BUFFALO JUNIPER		•			•														
TAM JUNIPER		•			•	•													
TABLE TOP JUNIPER		•			•					•									
WICHITA BLUE JUNIPER		•			•					•									
MOUNTAIN LAUREL		•		•		•										•		•	
JAPANESE KERRIA	•				•	•						•					•		
GOLDEN VICARY PRIVET		•			•		•												
COMMON PRIVET		•			•	•													
STAR MAGNOLIA		•			•	•						•				•		•	
OREGON HOLLYGRAPE		•		•		•							•	•			•		
DWARF OREGON HOLLYGRAPE		•			•	•							•	•			•		
GLACIER MOCKORANGE			•		•	•										•			
MINNESOTA SNOWFLAKE MOCKORANGE			•		•	•										•			
MINIATURE SNOWFLAKE MOCKORANGE		•			•	•										•			
DART'S GOLDEN NINEBARK		•			•		•					•							
MAXWELL SPRUCE		•			•	•													
BIRD'S NEST SPRUCE		•			•	•													
GLOBE BLUE SPRUCE		•			•					•									
MUGO PINE		•		•		•													
DWARF MUGO PINE		•			•	•													
BUSH CINQUEFOIL	•				•	•									•	•	•	•	
OTTO LUYKEN LAUREL		•			•	•										•			
SCHIPKA LAUREL		•			•	•										•			
YUKON BELLE FIRETHORN		•		•		•										•			
CATAWBA RHODODENRON			•		•	•										•	•	•	•
EXBURY AZALEA		•		•		•							•			•	•	•	
WILSON RHODODENDRON		•			•	•												•	•
NORTHERN LIGHTS AZALEA		•			•	•							•			•	•	•	•
PJM RHODODENDRON		•			•	•								•		•			•
RAMPO RHODOENDRON		•			•	•													•
FRAGRANT SUMAC		•			•	•							•				•		
STAGHORN SUMAC			•	•		•							•				•		
FERNLEAF STAGHORN SUMAC	•			•		•							•				•		
ALPINE CURRENT		•			•	•						•							
GOLDEN CURRENT		•			•		•					•							
JAPNESE WHITE SPIREA		•			•	•							•			•			
CRISPLEAF SPIREA	•				•	•							•					•	

COMMON NAME	GROWTH REQUIREMENTS: SUN	PART SHADE	FULL SHADE	WELL DRAINED SOILS	RICH MOIST SOILS	ACID SOILS	WIND PROTECTION	SPECIAL CHAR.: FLOWERS	FRUITS	FRAGRANT	DROUGHT TOLERANT	HAS THORNS	RED / YELLOW STEMS
BLUE RUG JUNIPER	•	•		•							•		
DWARF JAPGARDEN	•			•									
BROADMOOR JUNIPER	•	•		•									
BUFFALO JUNIPER	•	•		•									
TAM JUNIPER	•	•		•									
TABLE TOP JUNIPER	•	•		•							•		
WICHITA BLUE JUNIPER	•	•		•							•		
MOUNTAIN LAUREL		•	•		•	•	•	•					
JAPANESE KERRIA		•	•	•				•					
GOLDEN VICARY PRIVET	•	•											
COMMON PRIVET	•	•											
STAR MAGNOLIA	•	•			•		•	•					
OREGON HOLLYGRAPE		•	•		•		•	•	•				
DWARF OREGON HOLLYGRAPE		•	•		•		•	•	•				
GLACIER MOCKORANGE	•	•						•		•			
MINNESOTA SNOWFLAKE MOCKORANGE	•	•						•		•			
MINIATURE SNOWFLAKE MOCKORANGE	•	•						•		•			
DART'S GOLDEN NINEBARK	•	•									•		
MAXWELL SPRUCE	•	•		•									
BIRD'S NEST SPRUCE	•	•											
GLOBE BLUE SPRUCE	•	•		•									
MUGO PINE	•	•		•									
DWARF MUGO PINE	•	•		•									
BUSH CINQUEFOIL	•	•		•				•			•		
OTTO LUYKEN LAUREL		•	•		•		•	•					
SCHIPKA LAUREL		•	•		•		•	•					
YUKON BELLE FIRETHORN	•	•	•	•			•	•	•			•	
CATAWBA RHODODENRON		•	•		•	•	•	•					
EXBURY AZALEA	•	•	•		•	•		•					
WILSON RHODODENDRON		•	•		•	•	•	•					
NORTHERN LIGHTS AZALEA	•	•	•		•	•		•					
PJM RHODODENDRON	•	•	•		•	•		•					
RAMPO RHODOENDRON		•	•		•	•	•	•					
FRAGRANT SUMAC	•	•	•					•					
STAGHORN SUMAC	•	•		•				•	•		•		
FERNLEAF STAGHORN SUMAC	•	•		•				•	•		•		
ALPINE CURRENT	•	•	•										
GOLDEN CURRENT	•	•											
JAPNESE WHITE SPIREA	•	•						•					
CRISPLEAF SPIREA	•	•						•					

COMMON NAME	USES: SPECIMENT USE	GROUND COVER	BORDER	LOW SCREEN	HEDGE / TALL SCREEN	BARRIER PLANTING	PARKING LOTS	PARKS / OPEN SPACES	PLAYGROUNDS	PLAZAS	BUILDING ENTRIES	FOUND. PLANTING	NATURALIZED AREAS	MINIMUM PLANTING SIZE: 12 IN. - 15 IN.	15 IN. - 18 IN.	18 IN. - 24 IN.	24 IN. - 30 IN.	30 IN. - 36 IN.	3 FT. - 24 FT.
BLUE RUG JUNIPER		•					•	•	•	•	•	•				•			
DWARF JAPGARDEN		•								•	•	•			•				
BROADMOOR JUNIPER		•	•				•	•	•	•	•	•				•			
BUFFALO JUNIPER		•					•	•	•	•	•	•				•			
TAM JUNIPER			•	•			•	•	•	•	•	•				•			
TABLE TOP JUNIPER					•	•		•	•			•					•		
WICHITA BLUE JUNIPER					•			•	•			•							•
MOUNTAIN LAUREL	•				•			•		•	•	•				•			
JAPANESE KERRIA					•			•	•			•				•			
GOLDEN VICARY PRIVET					•	•		•	•							•			
COMMON PRIVET					•	•		•	•							•			
STAR MAGNOLIA	•							•		•	•	•					•		
OREGON HOLLYGRAPE					•	•		•				•				•			
DWARF OREGON HOLLYGRAPE			•	•				•		•	•	•			•				
GLACIER MOCKORANGE					•	•		•	•			•				•			
MINNESOTA SNOWFLAKE MOCKORANGE					•	•		•	•			•					•		
MINIATURE SNOWFLAKE MOCKORANGE			•	•			•	•	•	•	•	•			•				
DART'S GOLDEN NINEBARK					•		•	•	•			•				•			
MAXWELL SPRUCE			•	•						•	•	•			•				
BIRD'S NEST SPRUCE			•	•			•	•	•	•	•	•			•				
GLOBE BLUE SPRUCE	•			•				•	•	•	•	•				•			
MUGO PINE					•	•		•	•			•	•			•			
DWARF MUGO PINE			•	•			•	•	•	•	•	•			•				
BUSH CINQUEFOIL			•	•			•	•	•	•	•	•			•				
OTTO LUYKEN LAUREL				•				•		•	•	•				•			
SCHIPKA LAUREL					•			•				•				•			
YUKON BELLE FIRETHORN					•	•	•	•		•	•	•				•			
CATAWBA RHODODENRON	•				•			•			•	•				•			
EXBURY AZALEA							•	•			•	•				•			
WILSON RHODODENDRON			•							•	•	•			•				
NORTHERN LIGHTS AZALEA	•				•			•		•	•	•				•			
PJM RHODODENDRON			•							•	•	•				•			
RAMPO RHODOENDRON			•							•	•	•			•				
FRAGRANT SUMAC		•	•					•	•			•		•					
STAGHORN SUMAC													•						•
FERNLEAF STAGHORN SUMAC								•				•	•						•
ALPINE CURRENT					•			•	•	•	•	•				•			
GOLDEN CURRENT			•	•			•	•	•	•	•	•			•				
JAPNESE WHITE SPIREA			•				•	•	•	•	•	•			•				
CRISPLEAF SPIREA			•							•	•	•		•					

FAIRCHILD AIR FORCE BASE
LANDSCAPE MASTER PLAN

SHRUB PLANT MATRIX

COMMON NAME	BOTANICAL NAME	CULTIVAR	HABIT							MATURE HEIGHT					MATURE SPREAD				GROWTH RATE		
			PROSTRATE	SPREADING	ROUNDED	PYRAMIDAL	UPGRIGHT	COLUMNAR	VINING/CLIMBING	UNDER 1 FT.	1 FT. - 3 FT.	3 FT. - 6 FT.	6 FT. - 10 FT.	OVER 10 FT.	UNDER 3 FT.	3 FT. - 6 FT.	6 FT. - 10 FT.	OVER 10 FT.	SLOW	MEDIUM	FAST
ANTHONY WATERER SPIREA	SPIREA X BUMALDA	ANTHONY WATERER			•						•					•					•
GOLD FLAME SPIREA	SPIREA X BUMALDA	GOLD FLAME			•						•					•					•
LIMEMOUND SPIREA	SPIREA X BUMALDA	LIMEMOUND			•						•				•					•	
ALPINE DAPHINE SPIREA	SPIREA JAPONICA VAR. ALPINA			•							•					•			•		
GLODMOUND SPIREA	SPIREA JAPONICA	GOLDMOUND			•						•					•				•	
LITTLE PRINCESS SPIREA	SPIREA JAPONICA	LITTLE PRINCESS			•						•				•					•	
SHIROBANA SPIREA	SPIREA JAPONICA	SHIROBANA			•						•					•					•
SNOWMOUND SPIREA	SPIREA NIPPONCIA	SNOWMOUND			•							•				•					•
LATE LILAC	SYRINGA VILLOSA						•						•			•				•	
COMMON LILAC	SYRINGA VULGRAS						•							•			•			•	
SPREADING ENGLISH YEW	TAXUS BACCATA	REPANDENS		•							•						•		•		
JAPANESE YEW	TAXUS CUSPIDATA	DENSA		•								•					•		•		
SPREADING ANGLOJAP YEW	TAXUS X MEDIA	DENIFORMS		•								•				•			•		
HATFIELD YEW	TAXUS X MEDIA	HATFIELDII				•								•			•		•		
HICKI YEW	TAXUS X MEDIA	HICKII						•						•		•			•		
WARDI YEW	TAXUS X MEDIA	WARDII		•								•						•	•		
COLUMNAR ABORVITAE	THUUJA OCCIENTALIS	EMERALD						•						•		•			•		
BURKWOOD VIBURNUM	VIBURNUM X BURKWOODII						•						•				•			•	
MOHAWK VIBURNUM	VIBURNUM X BURKWOODII	MOHAWK			•								•				•			•	
JUDO VIRBURNUM	VIBURNUM JUDDII				•								•			•			•		
DWARF EUROPEAN CRANBERRY BUSH	VIBURNUM OPULUS	COMPACTUM			•							•				•				•	
MARIES DOUBLEFILE VIBURNUM	VIBURNUM PLICATUM VAR. TOMENTOSUM	MARIESII			•								•				•			•	
ONONDAGA VIBURNUM	VIBURNUM SARGENTII	ONONDAGA			•							•				•				•	
AMERICAN CRANBERRY BUSH	VIBURNUM TRILOBUM	WENTWORTH			•								•				•			•	
ALFREDO VIBURNUM	VIBURNUM TRILOBUM	ALREDO			•							•				•				•	
ADAM'S NEEDLE YUCCA	YUCCA FILAMENTOSA				•						•				•					•	
GOLDEN SWORD YUCCA	YUCCA FLACCIDA	GOLDEN SWORD			•						•				•					•	

COMMON NAME	LEAF TYPE			TEXTURE					LEAV COLOR						FALL COLOR				FLOWER COLOR			
	DECIDUOUS	NEEDLELEAF EVERGR.	BROADLEAF EVERGR.	FINE	MEDIUM	COARSE	OPEN	DENSE	GREEN / BLUE - GREEN	YELLOW	RED / MAROON	PURPLE	SILVER BLUE	VARIEGATED	YELLOW	RED / RUSSET	PURPLE	BROWN	WHITE	YELLOW / ORAGE	PINK / RED	BLUE / PURPLE
ANTHONY WATERER SPIREA	•				•			•	•							•					•	
GOLD FLAME SPIREA	•				•			•		•	•					•					•	
LIMEMOUND SPIREA	•				•			•	•	•						•					•	
ALPINE DAPHINE SPIREA	•			•				•	•							•					•	
GLODMOUND SPIREA	•				•			•		•						•					•	
LITTLE PRINCESS SPIREA	•				•			•	•							•					•	
SHIROBANA SPIREA	•				•			•	•							•			•		•	
SNOWMOUND SPIREA	•				•			•	•							•			•			
LATE LILAC	•				•			•	•												•	•
COMMON LILAC	•					•		•	•										•		•	•
SPREADING ENGLISH YEW		•			•			•	•													
JAPANESE YEW		•			•			•	•													
SPREADING ANGLOJAP YEW		•			•			•	•													
HATFIELD YEW		•			•			•	•													
HICKI YEW		•			•			•	•													
WARDI YEW		•			•			•	•													
COLUMNAR ABORVITAE		•		•				•	•													
BURKWOOD VIBURNUM	•				•			•	•							•			•			
MOHAWK VIBURNUM	•				•			•	•							•			•			
JUDO VIRBURNUM	•				•			•	•							•			•			
DWARF EUROPEAN CRANBERRY BUSH	•				•			•	•							•			•			
MARIES DOUBLEFILE VIBURNUM	•				•			•	•							•			•			
ONONDAGA VIBURNUM	•					•		•	•						•	•			•			
AMERICAN CRANBERRY BUSH	•				•			•	•							•			•			
ALFREDO VIBURNUM	•				•			•	•							•			•			
ADAM'S NEEDLE YUCCA			•		•			•	•										•			
GOLDEN SWORD YUCCA			•		•			•		•									•			

COMMON NAME	GROWTH REQUIREMENTS							SPECIAL CHAR.					
	SUN	PART SHADE	FULL SHADE	WELL DRAINED SOILS	RICH MOIST SOILS	ACID SOILS	WIND PROTECTION	FLOWERS	FRUITS	FRAGRANT	DROUGHT TOLERANT	HAS THORNS	RED / YELLOW STEMS
ANTHONY WATERER SPIREA	•	•						•					
GOLD FLAME SPIREA	•	•						•					
LIMEMOUND SPIREA	•	•						•					
ALPINE DAPHINE SPIREA	•	•						•					
GLODMOUND SPIREA	•	•						•					
LITTLE PRINCESS SPIREA	•	•						•					
SHIROBANA SPIREA	•	•						•					
SNOWMOUND SPIREA	•	•						•					
LATE LILAC	•		•					•		•			
COMMON LILAC	•		•					•		•			
SPREADING ENGLISH YEW		•	•	•			•						
JAPANESE YEW		•	•	•			•						
SPREADING ANGLOJAP YEW	•	•	•	•			•						
HATFIELD YEW	•	•	•	•			•						
HICKI YEW	•	•	•	•			•						
WARDI YEW		•	•	•			•						
COLUMNAR ABORVITAE	•	•		•			•						
BURKWOOD VIBURNUM	•	•		•				•		•			
MOHAWK VIBURNUM	•	•		•				•		•			
JUDO VIRBURNUM	•	•		•				•		•			
DWARF EUROPEAN CRANBERRY BUSH	•	•						•	•				
MARIES DOUBLEFILE VIBURNUM	•	•		•				•	•				
ONONDAGA VIBURNUM	•	•		•				•	•				
AMERICAN CRANBERRY BUSH	•	•		•				•	•				
ALFREDO VIBURNUM	•	•		•									
ADAM'S NEEDLE YUCCA	•	•		•				•			•		
GOLDEN SWORD YUCCA	•	•						•			•		

COMMON NAME	USES													MINIMUM PLANTING SIZE					
	SPECIMENT USE	GROUND COVER	BORDER	LOW SCREEN	HEDGE / TALL SCREEN	BARRIER PLANTING	PARKING LOTS	PARKS / OPEN SPACES	PLAYGROUNDS	PLAZAS	BUILDING ENTRIES	FOUND. PLANTING	NATURALIZED AREAS	12 IN. - 15 IN.	15 IN. - 18 IN.	18 IN. - 24 IN.	24 IN. - 30 IN.	30 IN. - 36 IN.	3 FT. - 24 FT.
ANTHONY WATERER SPIREA			•	•			•	•	•	•	•	•			•				
GOLD FLAME SPIREA			•	•			•	•	•	•	•	•			•				
LIMEMOUND SPIREA			•				•	•	•	•	•	•			•				
ALPINE DAPHINE SPIREA			•							•	•	•		•					
GLODMOUND SPIREA			•	•			•	•	•	•	•	•			•				
LITTLE PRINCESS SPIREA			•	•			•	•	•	•	•	•			•				
SHIROBANA SPIREA			•	•			•	•	•	•	•	•			•				
SNOWMOUND SPIREA				•			•	•	•	•	•	•				•			
LATE LILAC					•			•	•			•						•	
COMMON LILAC					•			•	•			•							•
SPREADING ENGLISH YEW			•	•				•	•	•	•	•				•			
JAPANESE YEW				•				•	•	•	•	•				•			
SPREADING ANGLOJAP YEW				•			•	•	•	•	•	•				•			
HATFIELD YEW					•	•		•	•			•					•		
HICKI YEW					•			•	•			•						•	
WARDI YEW					•	•		•	•			•					•		
COLUMNAR ABORVITAE					•			•	•			•							•
BURKWOOD VIBURNUM					•	•		•	•			•						•	
MOHAWK VIBURNUM					•	•		•	•			•					•		
JUDO VIRBURNUM					•	•		•	•			•					•		
DWARF EUROPEAN CRANBERRY BUSH				•			•	•			•	•				•			
MARIES DOUBLEFILE VIBURNUM	•				•	•		•				•						•	
ONONDAGA VIBURNUM					•	•		•				•					•		
AMERICAN CRANBERRY BUSH					•	•		•				•						•	
ALFREDO VIBURNUM				•			•	•	•		•	•				•			
ADAM'S NEEDLE YUCCA												•	•	•					
GOLDEN SWORD YUCCA												•	•	•					

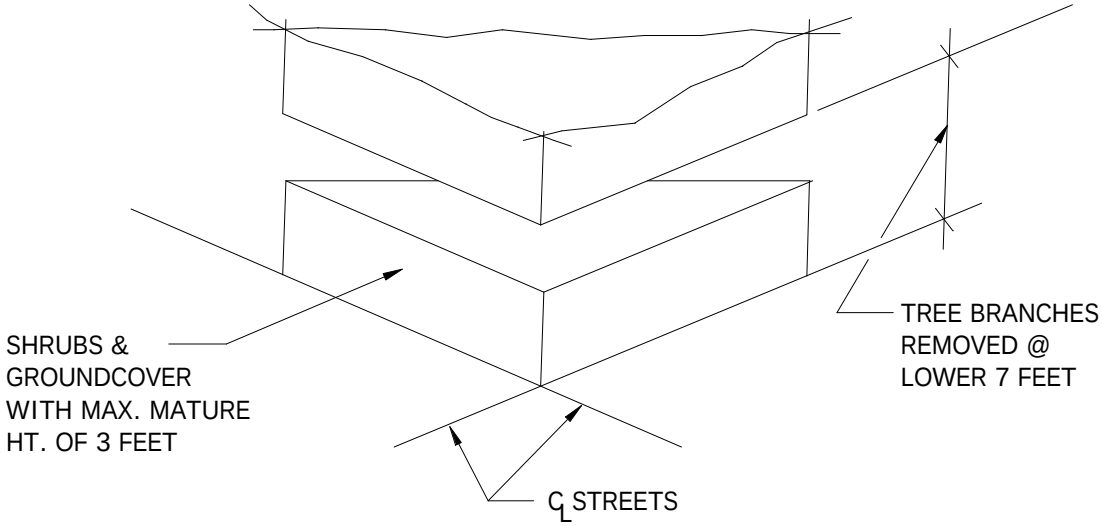
FAIRCHILD AIR FORCE BASE
LANDSCAPE MASTER PLAN

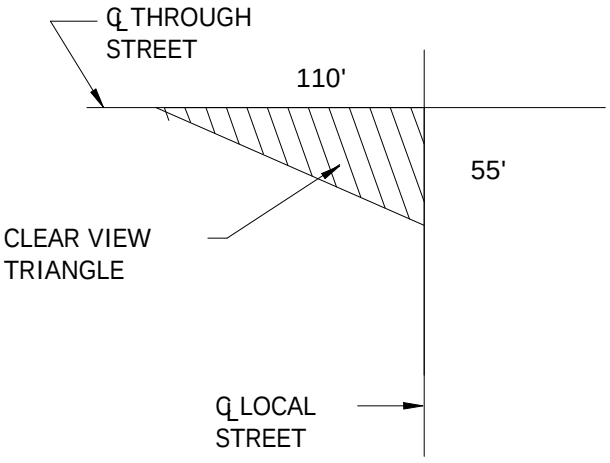
GROUND COVER PLANT MATRIX

COMMON NAME	BOTANICAL NAME	CULTIVAR	HABIT		MATURE HEIGHT			GROWTH RATE			LEAF TYPE			
			CREEPING	CLIMBING	UNDER 6 IN.	6 IN. - 12 IN.	OVER 12 IN.	SLOW	MEDIUM	FAST	DECIDUOUS	NEEDLELEAF EVERGREEN	BROADLEAF EVERGREEN	PERENNIAL
BISHOP'S WEED	AEGOPODIUM PODAGRARIA VAR. VARIEGATUM		•			•				•				•
BUGLEWEED	AJUGA REPTANS		•		•					•				•
KINNIKINICK	ARCTOSTAPHYLOS UVA-URSI		•			•		•					•	
BEARBERRY COTONEASTER	COTONEASTER DAMMERI	CORAL BEAUTY	•				•			•			•	
PURPLELEAF WINTERCREEPER	EVONYMUS FORTUNEI VAR. COLORATUS		•	•		•				•			•	
BALTIC IVY	HEDERA HELIX	BALTICA	•	•	•					•			•	
SARGENT JUNIPER	JUNIPERUS CHINENSIS VAR. SARGENTII		•				•	•				•		
BAR HARBOR JUNIPER	JUNIPERUS HORIZONTALIS	BAR HARBOR	•			•			•			•		
BLUE CHIP JUNIPER	JUNIPERUS HORIZONTALIS	BLUE CHIP	•			•			•			•		
EMERALD SPREADER JUNIPER	JUNIPERUS H ORIZONTALIS	EMERALD SPREADER	•		•				•			•		
TURQUOISE SPREADER JUNIPER	JUNIPERUS HORIZONTALIS	TURQUOISE SPREADER	•			•			•			•		
BLUE RUG JUNIPER	JUNIPERUS HORIZONTALIS	WILTONII	•		•				•			•		
DWARF JAPGARDEN JUNIPER	JUNIPERUS PROCUMBENS	NANA	•			•		•				•		
BUFFALO JUNIPER	JUNIPERUS SABINA	BUFFALO	•			•		•				•		
CREEPING MAHONIA	MAHONIA REPENS		•			•		•				•	•	
JAPANESE SPURGE	PACHYSANDRA TERMINALIS		•			•		•					•	
VIRGINA CREEPER	PARTHENOCISSUS QUINQUEFOLIA		•	•			•			•	•			
BOSTON IVY	PARTHENOCISSUS TRICUPIDATA			•			•			•	•			
CANBY PAXISTIMA	PAXISTIMA CANBYI		•			•		•					•	
FRAGRANT SUMAC	RHUS ARMOTICA	GRO-LOW	•				•		•		•			
PERWINKLE	VINCA MINOR		•		•				•				•	

COMMON NAME	TEXTURE			LEAF COLOR			FALL COLOR				GROWN REQUIREMENTS					
	FINE	MEDIUM	COARSE	GREEN / BLUE - GREEN	SILVER BLUE	VARIEGATED	YELLOW	REDRISSET	PURPLE	BROWN	SUN	PART SHADE	FULL SHADE	WELL DRAINED SOILS	RICH MOIST SOILS	ACID SOILS
BISHOP'S WEED			•			•				•		•	•			
BUGLEWEED		•		•		•		•			•	•	•		•	
KINNIKINICK	•			•				•			•	•		•		•
BEARBERRY COTONEASTER	•			•				•	•		•	•		•		
PURPLELEAF WINTERCREEPER		•		•					•		•	•				
BALTIC IVY		•		•							•	•	•	•		
SARGENT JUNIPER		•		•							•	•		•		
BAR HARBOR JUNIPER		•		•							•	•		•		
BLUE CHIP JUNIPER		•			•						•	•		•		
EMERALD SPREADER JUNIPER		•		•							•	•		•		
TURQUOISE SPREADER JUNIPER		•		•							•	•		•		
BLUE RUG JUNIPER		•			•						•	•		•		
DWARF JAPGARDEN JUNIPER	•			•							•			•		
BUFFALO JUNIPER		•		•							•	•		•		
CREEPING MAHONIA		•		•					•			•	•		•	
JAPANESE SPURGE		•		•									•		•	•
VIRGINA CREEPER			•	•				•			•	•	•			
BOSTON IVY		•		•				•			•	•	•			
CANBY PAXISTIMA	•			•							•	•		•		
FRAGRANT SUMAC		•		•				•			•	•	•			
PERWINKLE	•			•								•	•		•	

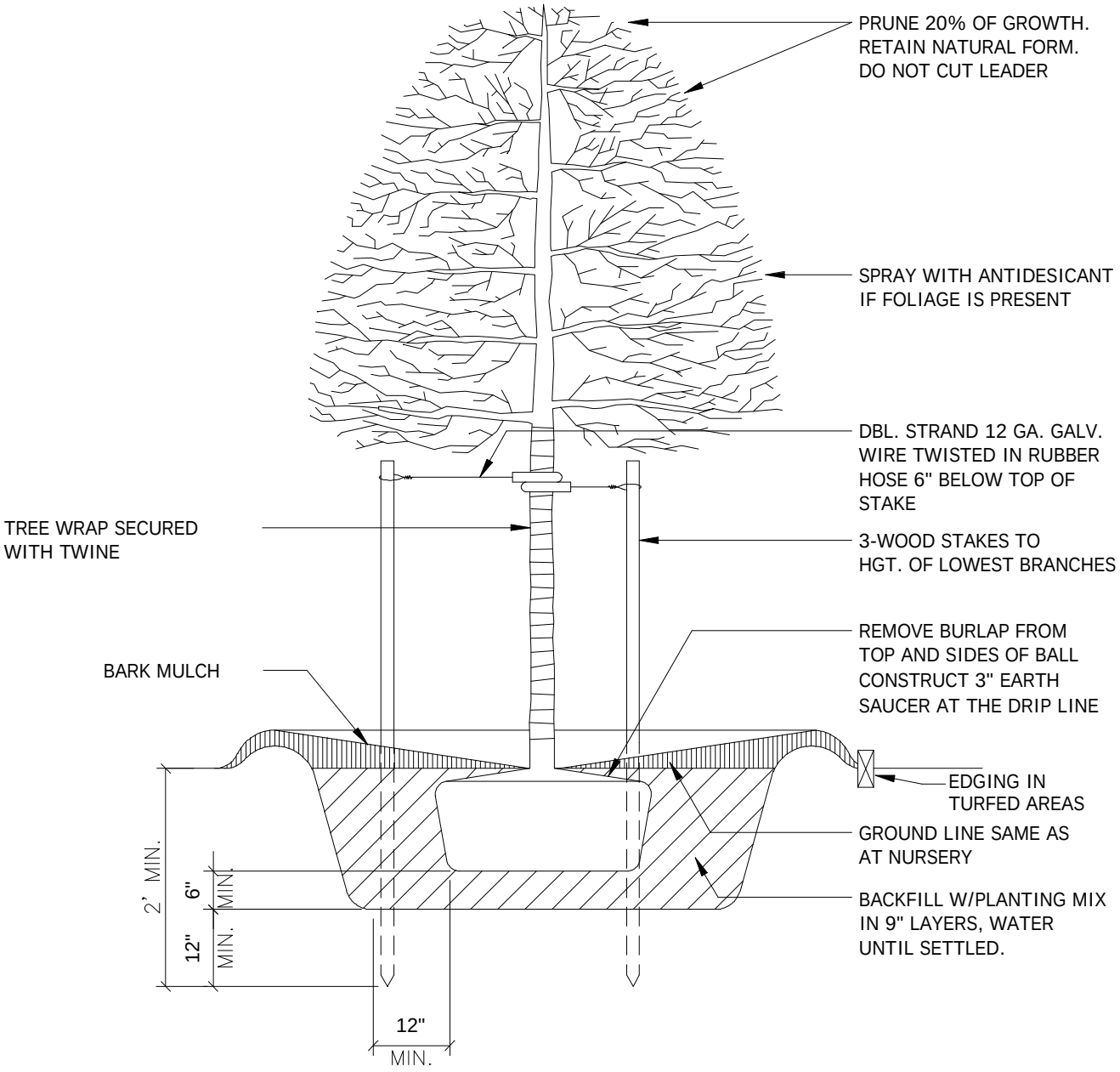
COMMON NAME	SPEC. CHAR.		USES								MINIMUM PLANTING SIZE			
	FLOWERS	FRUITS	PARKING LOTS	PARKS/OPEN SPACES	PLAYGROUNDS	PLAZAS	SHRUB BEDS	EMBANKMENTS	WALL COVER	NATURALIZED AREAS	4 IN. POTS	1 GAL.	2 GAL.	5 GAL.
BISHOP'S WEED	•			•			•				•			
BUGLEWEED	•			•		•	•				•			
KINNIKINICK		•		•		•	•	•		•		•		
BEARBERRY COTONEASTER		•	•	•		•	•	•					•	
PURPLELEAF WINTERCREEPER			•	•	•	•	•	•				•		
BALTIC IVY			•	•	•	•	•	•	•	•	•			
SARGENT JUNIPER			•	•	•	•		•						•
BAR HARBOR JUNIPER			•	•	•	•	•	•						•
BLUE CHIP JUNIPER			•	•	•	•	•	•						•
EMERALD SPREADER JUNIPER			•	•	•	•	•	•						•
TURQUOISE SPREADER JUNIPER			•	•	•	•	•	•						•
BLUE RUG JUNIPER			•	•	•	•	•	•						•
DWARF JAPGARDEN JUNIPER						•	•						•	
BUFFALO JUNIPER			•	•	•	•	•	•						•
CREEPING MAHONIA	•	•		•		•	•					•		
JAPANESE SPURGE				•		•	•				•			
VIRGINA CREEPER								•	•	•	•			
BOSTON IVY									•		•			
CANBY PAXISTIMA				•			•	•				•		
FRAGRANT SUMAC	•			•	•			•					•	
PERWINKLE	•			•		•	•	•				•		





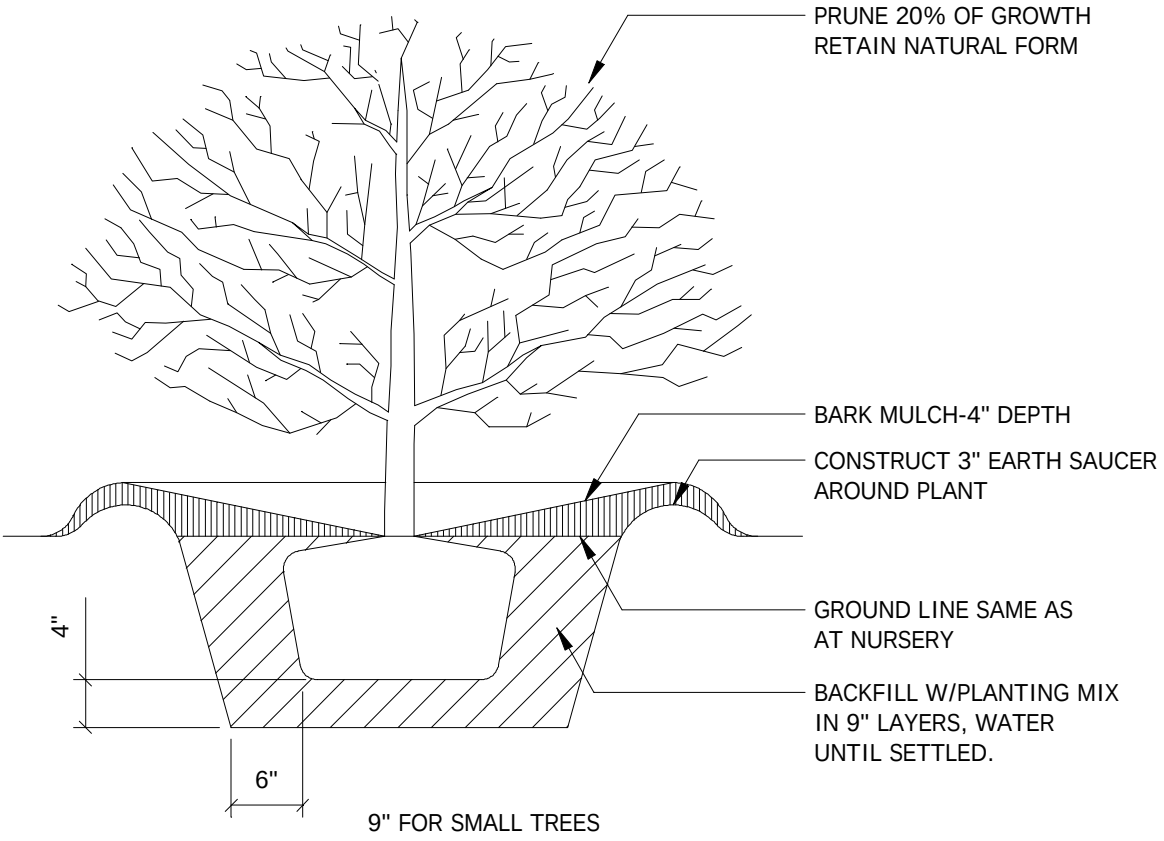
1 CLEAR VIEW TRIANGLE

SCALE: NONE



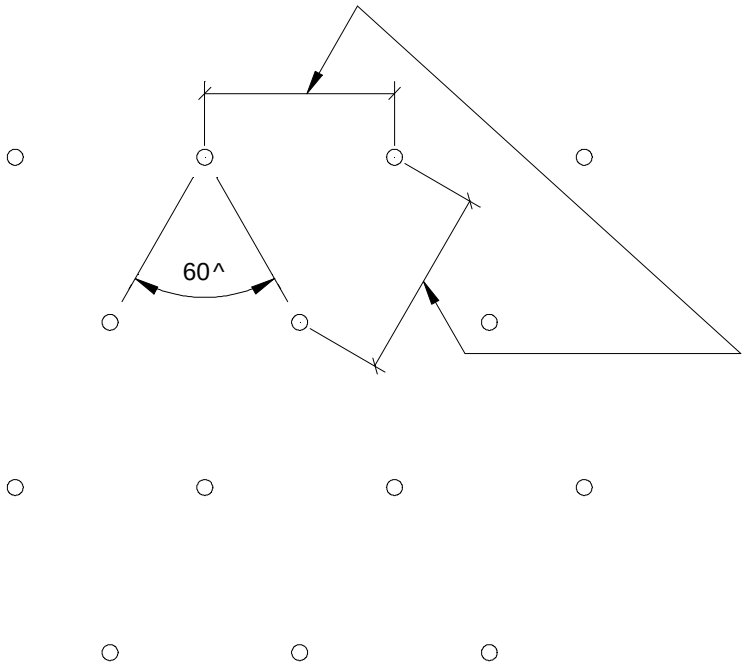
2 TREE PLANTING

SCALE: NONE CONIFERS SIMILAR



3 SHRUB PLANTING

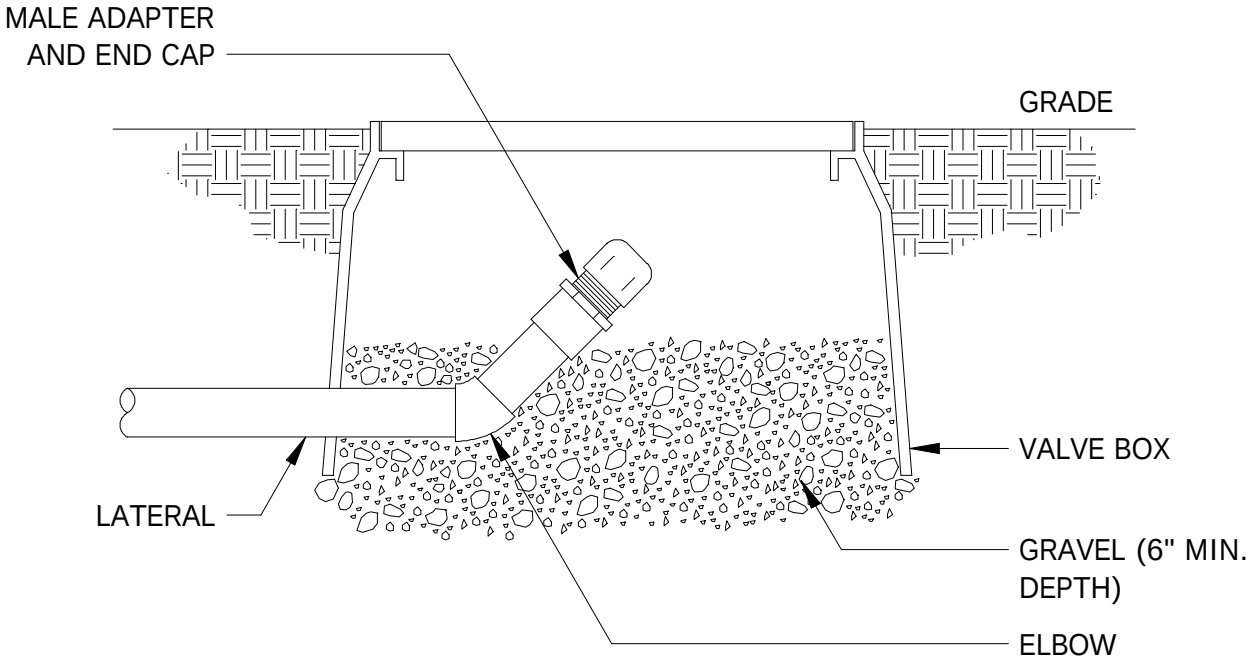
SCALE: NONE SMALL TREES SIMILAR



NOTE:
SHRUB PLANTINGS
SIMILAR WHERE
APPLICABLE.

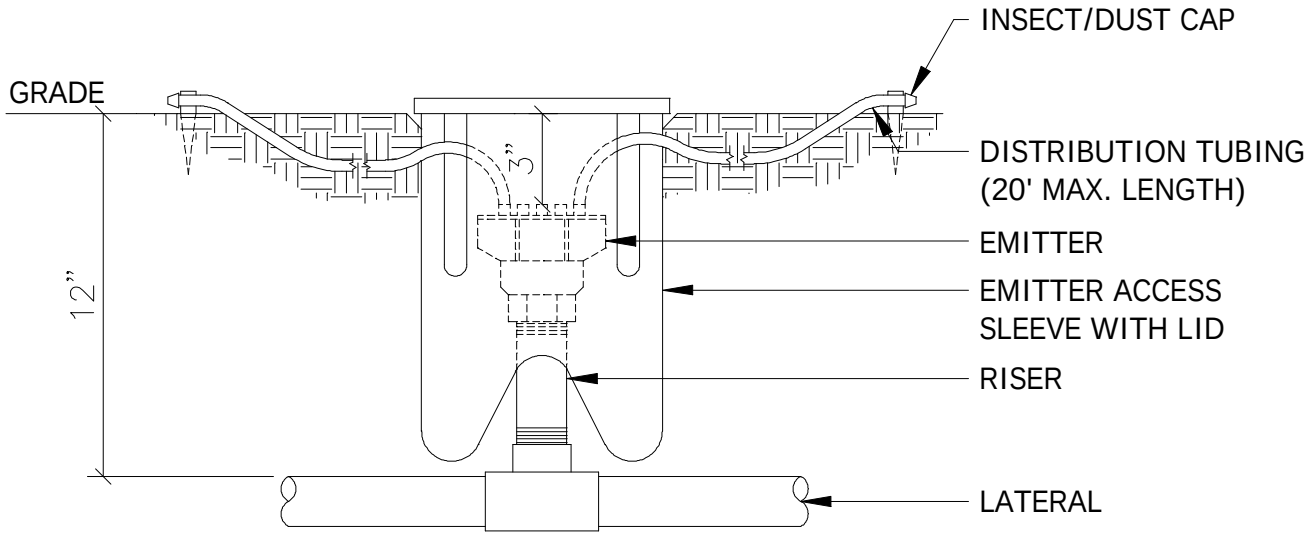
4 GROUND COVER PLANTING

SCALE: NONE



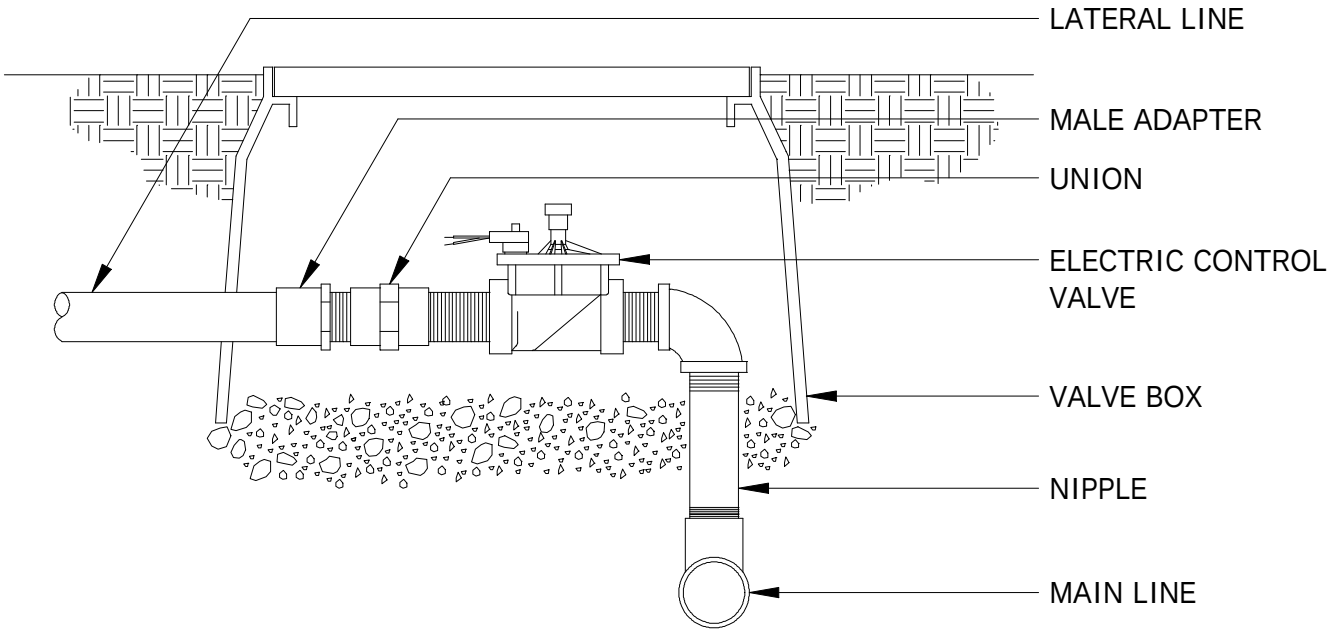
5 FLUSH POINT

SCALE: NONE



6 EMITTER

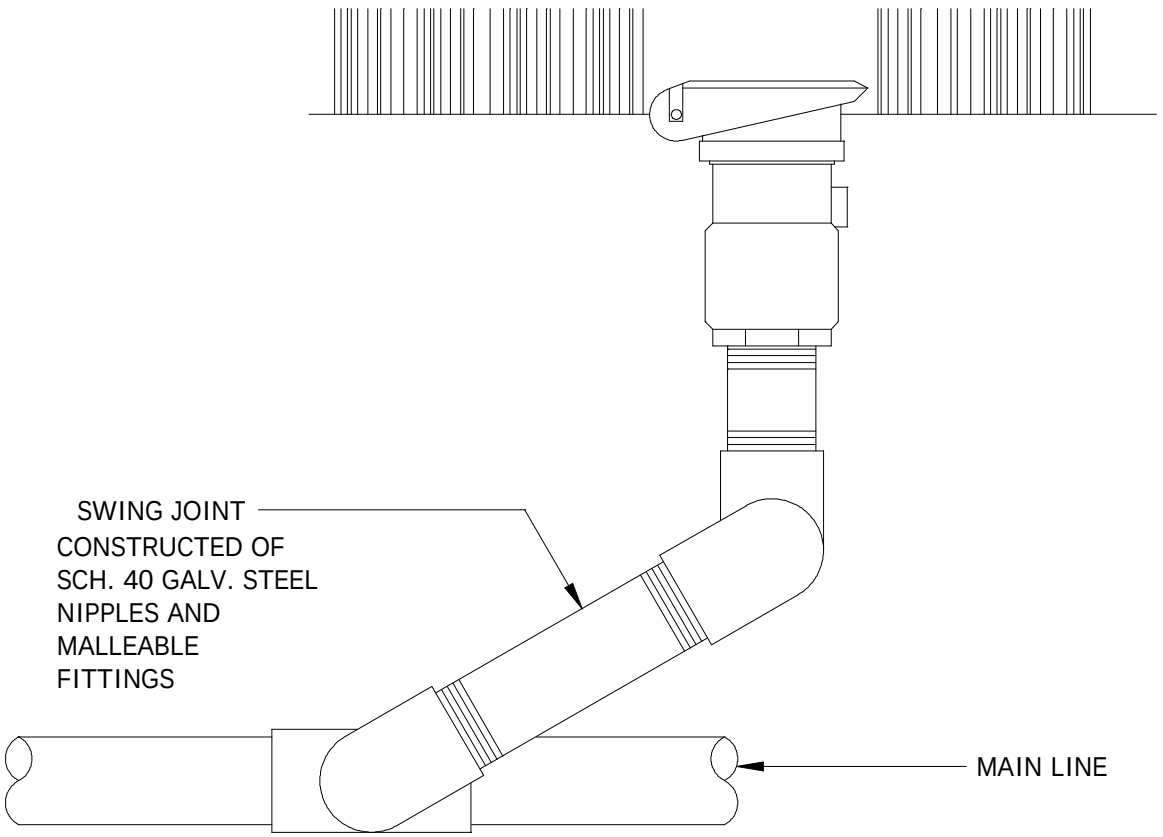
SCALE: NONE



ELECTRIC REMOTE CONTROL VALVE

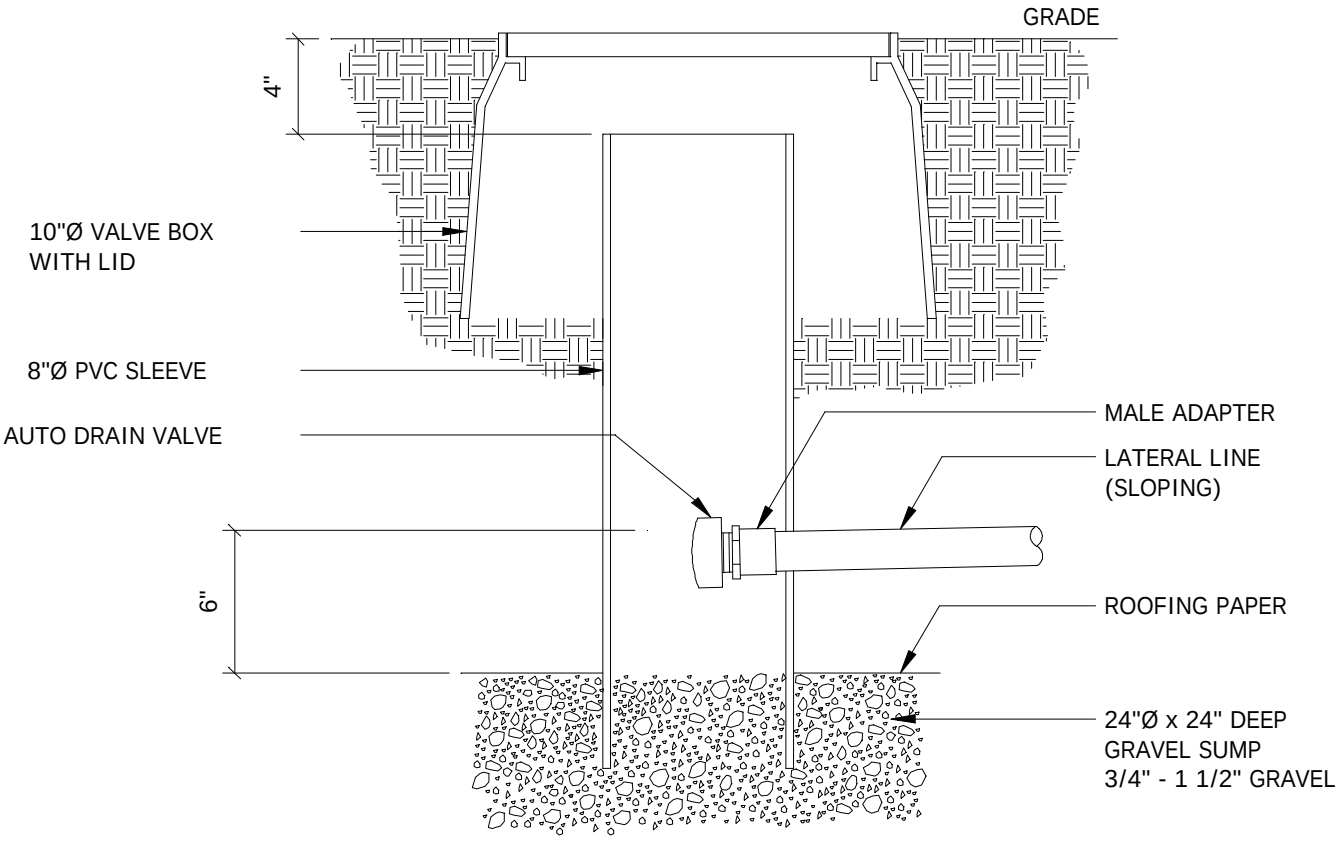
7

SCALE: NONE



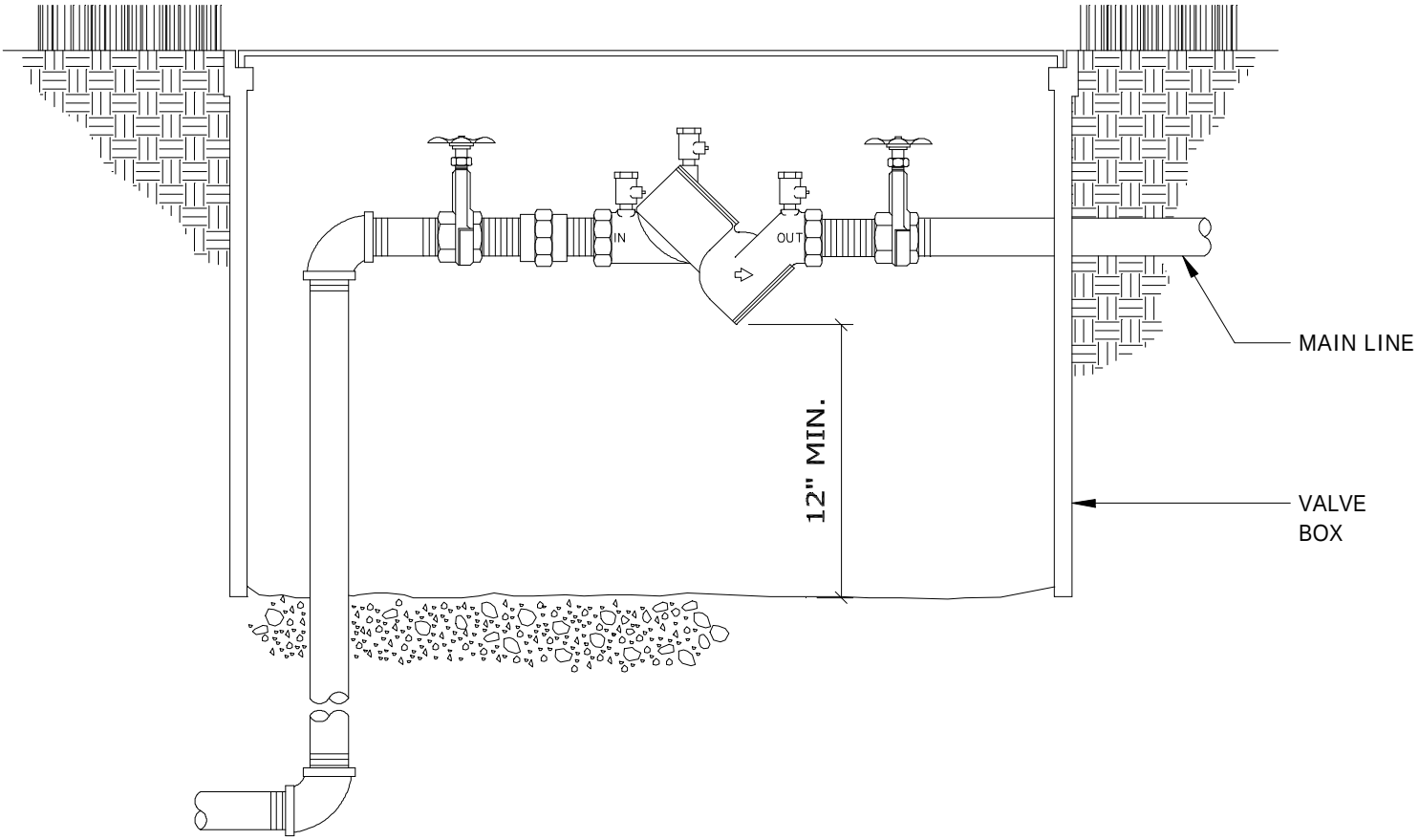
8 QUICK COUPLER VALVE

SCALE: NONE



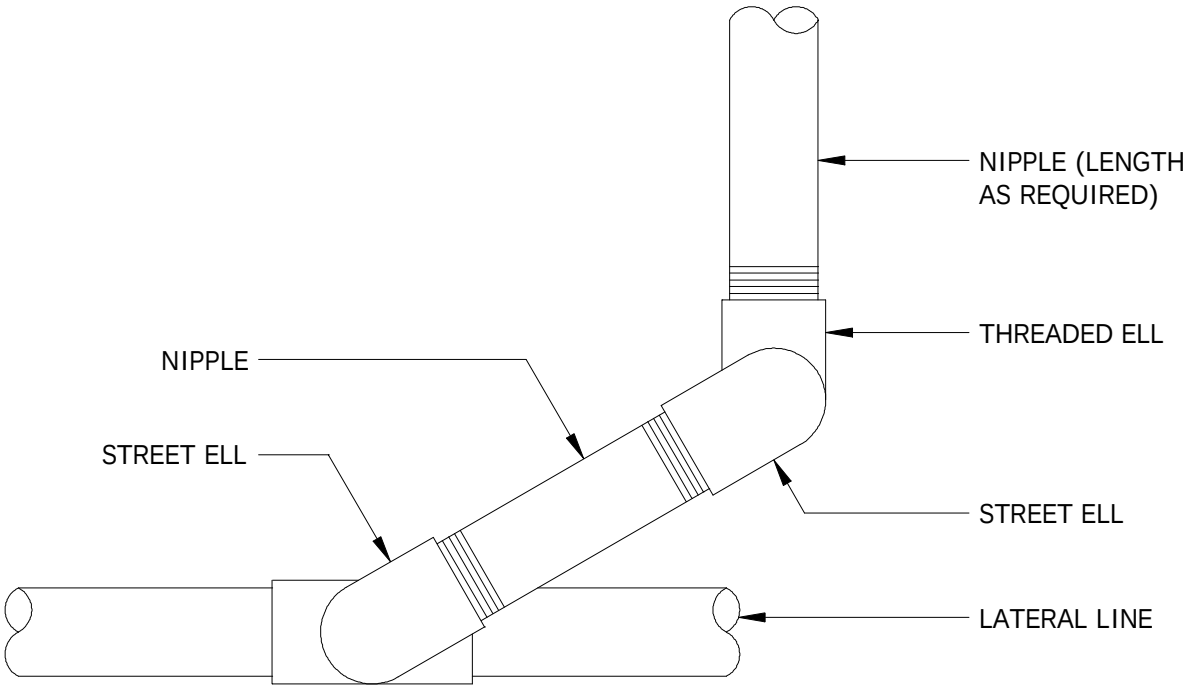
9 AUTO DRAIN VALVE

SCALE: NONE



10 BACKFLOW PREVENTER

SCALE: NONE



11 SWING JOINT DETAIL

SCALE: NONE

DIVISION 3

SECTION 03000 - GENERAL INFORMATION

WITH THE EXCEPTION OF AIRFIELD PORTLAND CEMENT CONCRETE PAVEMENTS (PCCP) WHICH ARE DESCRIBED IN SECTION 02000, THIS DIVISION CONTAINS NO REQUIREMENTS SPECIFIC TO FAIRCHILD AIR FORCE BASE. USE AIR FORCE INSTRUCTIONS (AFIs), MILITARY HANDBOOKS (MIL-HDBKs), ENGINEERING TECHNICAL LETTERS (ETLs), CONSTRUCTION TECHNICAL LETTERS (CTLs), CIVIL ENGINEERING TECHNICAL SUPPORT OFFICE (CETSO) LETTERS, AIR MOBILITY COMMAND (AMC) COMMANDER'S GUIDES, AND OTHER DESIGN DIRECTIVES ESTABLISHED BY THE AIR FORCE, IN COORDINATION WITH MASTERSPEC STANDARD SPECIFICATIONS WHEN DEVELOPING SPECIFICATIONS FOR THIS DIVISION.

END OF SECTION

DIVISION 4

SECTION 04000 - GENERAL INFORMATION

A. When developing specifications for this section, refer to the Fairchild Air Force Base Design Standards sectional information developed by the 92d Civil Engineer Squadron Engineering Flight.

B. Fairchild Air Force Base has adopted the "Affirmative Procurement Plan" dated August 1999 regarding recycling and conserving resources. The Plan requires that some construction materials, such as **cement and concrete (including products such as pipe and block) containing fly ash or ground-granulated blast furnace (GGBF) slag**, be composed of a minimum percentage of recycled products. It is therefore mandatory that designers obtain a copy of the Plan from the Contracting Officer in order to familiarize themselves with the requirements related to developing specifications for the particular product, possible exemptions allowed, and required documentation for both the design analysis and the construction phase.

END OF SECTION

DIVISION 4

SECTION 04200 - UNIT MASONRY

A. Face Brick:
   Color: Brown Varitone Wirecut as manufactured by Interpace Industries Inc.,
   Imperial Red Mission as manufactured by Interpace Industries Inc.,
   or as approved by the Base.

B. Brick Panel Systems:
   Color: See paragraph "A" above.

C. Concrete Masonry Unit:
   Color: Color shall be integral to the block. Antique Linen color requirement as manufactured by : White Block Color No. FC-569W
   Layrite Color No. W-75.
   Colors from other suppliers will require samples for Government approval as equals to those listed.

D. General/Misc. Design Related Comments:

1. Block shall be tested for limited efflorescence. Upon completion the, block wall shall be cleaned and sealed.

2. When installing block/brick walls around exterior electrical equipment (e.g., transformers and junction cabinets), provide minimum 8' clearance on operable sides for "hot stick" work. Provide minimum 4' clearance on all other sides.

END OF SECTION

DIVISION 5

SECTION 05000 - GENERAL INFORMATION

THIS DIVISION CONTAINS NO REQUIREMENTS SPECIFIC TO FAIRCHILD AIR FORCE BASE. USE AIR FORCE INSTRUCTIONS (AFIs), MILITARY HANDBOOKS (MIL-HDBKs), ENGINEERING TECHNICAL LETTERS (ETLs), CONSTRUCTION TECHNICAL LETTERS (CTLs), CIVIL ENGINEERING TECHNICAL SUPPORT OFFICE (CETSO) LETTERS, AIR MOBILITY COMMAND (AMC) COMMANDER'S GUIDES, AND OTHER DESIGN DIRECTIVES ESTABLISHED BY THE AIR FORCE, IN COORDINATION WITH MASTERSPEC STANDARD SPECIFICATIONS WHEN DEVELOPING SPECIFICATIONS FOR THIS DIVISION.

END OF SECTION

DIVISION 6

SECTION 06000 - GENERAL INFORMATION

A. Fairchild Air Force Base has adopted the "Affirmative Procurement Plan" dated August 1999 regarding recycling and conserving resources. The Plan requires that some construction materials, such as **structural fiberboard products (for applications other than building insulation) and laminated paperboard products (for applications other than building insulation)**, be composed of a minimum percentage of recycled products. It is therefore mandatory that designers obtain a copy of the Plan from the Contracting Officer in order to familiarize themselves with the requirements related to developing specifications for the particular product, possible exemptions allowed, and required documentation for both the design analysis and the construction phase.

END OF SECTION

DIVISION 7

SECTION 07000 - GENERAL INFORMATION

A. When developing specifications for this section, refer to the Fairchild Air Force Base Design Standards sectional information developed by the 92d Civil Engineer Squadron Engineering Flight.

B. Fairchild Air Force Base has adopted the "Affirmative Procurement Plan" dated August 1999 regarding recycling and conserving resources. The Plan requires that some construction materials, such as **building insulation products**, be composed of a minimum percentage of recycled products. It is therefore mandatory that designers obtain a copy of the Plan from the Contracting Officer in order to familiarize themselves with the requirements related to developing specifications for the particular product, possible exemptions allowed, and required documentation for both the design analysis and the construction phase.

END OF SECTION

DIVISION 7

SECTION 07410 - PREFORMED METAL ROOFING

A. When developing specifications for this section, use the standard Fairchild Air Force Base Specifications developed by the 92d Civil Engineer Squadron Engineering Flight and edit for the specific project. See attached Specification for example.

END OF SECTION

SECTION 07410- PREFORMED METAL ROOFING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Furnish and install complete, a preformed, prefinished, metal roofing system. System includes panels, concealed fasteners, brackets, clips, anchoring devices, structurals, spacers and trim, caps, flashing, closures, joint sealer, and other components needed for a complete, permanently weatherproof installation.

B. See Section 07200 INSULATION.

1.03 QUALITY ASSURANCE

A. All proposed roofing systems shall meet or exceed all physical properties of the system specified.

B. The installer of the system must be approved by the manufacturer.

C. The installer of the system must at all times have a representative on site who is completely familiar with entire system and who has experience in a minimum of three projects of similar size and scope.

D. Manufacturer's specifications or instructions for installing materials, equipment or other appurtenances furnished as part of this contract shall govern the installation except as modified herein and as shown on the drawings.

E. Except as otherwise indicated or recommended by panel manufacturer for superior performance of the work, comply with applicable recommendation and details of the "Architectural Sheet Metal Manual" by SMACNA.

1.04 SUBMITTALS

A. Manufacturer's Data: Submit copies of specifications, standard detail drawings and installation instructions. Include manufacturer's certification substantiating that materials and finishes comply with the specifications and drawings. Indicate by copy of transmittal

that the installer has received a copy of the installation instructions.

B. Samples: Submit two-2 foot long by full width samples of preformed metal roofing, 2 fastening clips and 12 fasteners. Submit sealant and sealant tape (one tube and one linear foot of tape) and one full size, top and bottom neoprene closure. Submit one prefabricated pipe flashing. Samples shall become property of the Government.

C. Shop Drawings: Submit shop drawings showing purlin spacing and attachment, clip spacing and attachment, profile of preformed metal roofing details of formings, anchorages, jointing, trim, flashings and accessories. Show details of edges, terminations and all penetrations. Show small scale layout of entire work.

1. Submit newly prepared information, drawn to accurate scale. Shop drawings shall include fabrication and installation drawings, setting diagrams, schedules, patterns, templates, and similar drawings. Include the following information:

a. Dimensions
b. Identification of products and materials included
c. Compliance with specified standards
d. Notation of coordination requirements
e. Notation of dimensions established by field measurement

D. Quality Assurance Data: Written designation and verification of items listed in paragraph 1.03, B and C and 2.01A9.

E. Certificates: Certificates attesting that the panels and accessories furnished conform to the requirements specified shall be provided. Certificate for the roof assembly furnished shall certify that the assembly complies with the material and fabrication requirements specified and is suitable for the installation at the indicated design slope.

1.05 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

American Iron and Steel Institute (AISI) Publication: Cold Formed Steel Design Manual (1986 Ed.)

Handbook, Fundamentals (1985 and Errata 1984)

American Society for Testing and Materials (ASTM) Publications:

A 446-87 Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality

A 525 Coating, Galvanized

A 463-85	Sheet Steel, Cold Rolled, Aluminum Coated, Type 1 and Type 2
A 792-86	Sheet Steel, Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
B 117-85	Salt Spray (Fog) Testing
D 659-86	Evaluating Degree of Chalking of Exterior Paints
D 714-56	Evaluating Degree of Blistering of (R 1986) Paints
D 968-81	Abrasion Resistance of Organic Coatings (R 1986) by Falling Abrasive
D 1737-85	Elongation of Attached Organic Coatings with Cylindrical Mandrel Apparatus
D 2244-85	Calculation of Color Differences from Instrumentally Measured Color Coordinates
D 2247-86a	Testing Water Resistance of Coatings in 100% Relative Humidity
E 96-80	Water Vapor Transmission of Materials

Underwriter's Laboratories, Inc., (UL) Publication:

UL 580	Wind-Uplift Resistance of Roof Assemblies (Nov 17, 1980, 2nd Ed)

PART 2 PRODUCTS

2.01 MATERIALS

A. Provide preformed metal roofing having as a minimum, the following characteristics:

1. Gauge: 24 steel conforming to ASTM A446, minimum yield 33,000 psi.

2. Pattern: Ribbed with configuration for overlapping adjacent sheets or interlocking ribs for securing adjacent sheets. Provide panels with three ribs: two outboard and one intermediate.

3. Rib Depth: 1½", snap locked. Mechanically field crimped is not acceptable.

4. Panel Width: 16"

5. Lengths: Maximum length from ridge to eave with no panel splices.

6. Coating: Galvanized, conforming to ASTM A525, minimum 0.90 oz of zinc per square foot, total both sides; aluminized, conforming to ASTM A463, minimum 0.65 oz of aluminum per square foot, total both sides or Galvalume, conforming to ASTM A792, minimum 0.55 oz of aluminum-zinc alloy per square foot.

7. Exterior and Interior Paint Finish: Provide corrosion-resistant primer and Polyvinylidene Fluoride (PVF2) finish coat (70% Kynar 500). Exterior color shall be an approved match of Sherwin-Williams paint color "Spanish Moss" #SW2070. The interior and exterior color finish shall meet the test requirements specified below. The manufacturer shall have conducted tests on previously manufactured sheets of the same type and finish as proposed for the project. The term "appearance of base metal" refers to the metal coating on steel base metal.

    a. Salt Spray Test: A sample of the sheets shall withstand a salt spray test for a minimum of 1000 hours in accordance with ASTM B177, including the scribe requirements in the test, the coating shall contain blisters larger than No. 8 on no more than 20% of exposed area.

    b. Formability Test: When subjected to a 180- degree bend over a 1/16" diameter mandrel in accordance with ASTM D 1737, exterior coating film shall show no evidence of fracturing to the naked eye.

    c. Accelerated Weathering: Chalking resistance and Color Change: A sample of the sheets shall withstand a weathering test a minimum of 2000 hours in accordance with ASTM G 23, using a Type D apparatus, without cracking, peeling, blistering, loss of adhesion of the protective coating, or corrosion of the base metal. Protective coating that can be readily removed from the base metal with a pen-knife blade or similar instrument shall be considered as an area indicating loss of adhesion. After the 2000-hour weatherometer test, exterior coating change shall not exceed 2 NBS units in accordance with ASTM D 2244.

    d. Humidity Test: When subjected to a humidity cabinet test in accordance with ASTM D 2247 for 1000 hours, a scored panel shall show no signs of blistering, cracking, creepage, or corrosion.

    e. Abrasion Resistant Test: When subjected to the falling sand test in accordance with ASTM D 968, the coating system shall withstand a minimum of 30 liters of sand before the appearance of the base metal.

8. Fastening System: Concealed, galvanized, 18 gauge steel clips formed to accommodate expansion and contraction without detrimental effect on roof panels. Conform to ASTM A446 Grade A and STM A525. Provide end-lap backer plates to stiffen joints and provide more thickness for fastening screws.

9. Uplift Rating: Underwriters Laboratories Class 90 wind uplift performance: Since UL 580 standard test does not represent installed conditions, provide additional engineering

to insure the necessary additional safety factors are used to govern the actual installation. Assure the complete roof system assembly is detailed to represent actual field installed conditions.

10. Preformed End Closures: Waterproof semirigid crosslinked polyethylne foam shaped to fit tightly the panel configuration. Molded closure strips shall be closed-cell or solid cell synthetic rubber or neoprene, or polyvinyl chloride premolded to match configuration of the covering and shall not absorb or retain water.

B. Sealants: Provide sealant type to be factory applied into the female lapping rib of the standing seam panel. Minimum service life of 20 years. In addition, provide gunnable sealant for field conditions to meet Fed Spec TT-S-00230C.

C. Miscellaneous Accessories: Except as noted on the drawings and in the specifications, fabricate trim, fascia, closure pieces, ridge, rakes, flashings, etc., from 24 gauge (minimum) metal, finish same as roof panels where exposed to view from grade, color to match Sherwin-Williams' color #SW2070, "Spanish Moss". Provide a complete and waterproof installation. Provide attachment hardware as necessary.

D. Snowguards: Provide 24-gauge (minimum) continuous sheet metal snowguard at roof eaves above (at a minimum) all walkways, entries, exits, etc. Extend snowguard at least 3 feet beyond each edge of walking surface. Match finish and color of roof panels. Provide all hardware necessary for attachment to roof surface.

E. Flashings:

1. Custom fabricated from material same as roof panels conforming to standards set forth in SMACNA, 24 gauge unless otherwise noted.

2. Dissimilar materials will not be allowed.

F. Fasteners: As recommended by the system manufacturer, zinc coated or cadmium plated steel, where hidden or concealed. Provide stainless steel with weather seal washers where exposed. The system shall have no fasteners penetrating the panels except at the ridge and/or cove.

G. Insulation: Refer to Section 07200, INSULATION, for specific requirements.

H. Felt/Paper: Provide 30 lb asphalt saturated felts conforming to ASTM D226-77 and rosin sheathing paper.

PART 3 EXECUTION

3.01 INSTALLATION

A. Fasten clips with appropriate fasteners to provide wind uplift ratings as specified.

B. After installation of decking, cover surface with one ply 30 lb asphalt saturated felt and rosin paper. Apply in shingle fashion. Provide two-inch side lap and four-inch end lap. Fasten as recommended by the insulation manufacturer.

C. Install roofing system in strict accordance with manufacturer's written instructions, except as modified herein. Sheets or panels shall have approved sidelap with top sheet lap facing away from prevailing weather. Install metal closures at exposed end openings of all sheets.

D. Flashing attachment and caps shall be mechanically fastened and sealed per manufacturer's recommendations. Install neoprene closures under flashings to fill voids in roof panel trays. Notch flashings perpendicular to ribs.

E. Sweep roof of all debris on completion of installation. Job shall be left clean and in a weathertight condition.

3.02 GUARANTEE

A. Prior to acceptance of work, furnish manufacturer's commercial 20-year material performance warranty. Limit to ordinary wear and tear by the elements or defects due to faulty materials and workmanship. In addition, provide a warranty of construction as shown on the last page of this section.

3.03 PERFORMANCE AGREEMENT SIGN

A. Provide 24" X 24" minimum size painted aluminum sign. Provide white background color and black copy. Use paint compatible with the aluminum. Copy shall be as shown on the drawings. Permanently mount sign located in the location as directed by the Contracting Officer.

3.04 PERFORMANCE AGREEMENT

FAR 52 246-21, Warranty of Construction, is a part of this contract. The requirements of the performance agreement are in addition to the requirement of that clause for the first year from the date of final acceptance. Also, the performance agreement remains in effect for four years thereafter. If the Contractor fails to make required repairs during the performance period, the Government may have the work done by others and charge the cost to the Contractor. The warranty provisions of the contract apply notwithstanding Government inspection and acceptance. For five years from date of final acceptance, the Contractor agrees to inspect, locate and make emergency repairs to defects and leaks in the roof system within 24 hours of receipt of notice from the Contracting Officer. Thereafter, as soon as weather permits, the Contractor agrees to permanently repair the affected areas by restoring them to the standard of the contract, without cost to the Government. However, the

Contractor will not be required to make any repairs if it is determined that these leaks or defects were caused by abuse, or by lightning, hurricane, tornado, hail storm, or other unusual natural phenomena or failure of related work installed by others. Receipt of notice from the Contracting Officer is evidence that the Contracting Officer has had the roof examined and determined that none of the above causes apply and the Contractor is obligated to make the repairs. The Contracting Officer's decision is conclusive. However, the performance agreement does not operate to obligate the surety after completion of work and final payment, except as provided for in FAR 52 246-21 and the Miller Act as amended (40 USC 270).

PROJECT NO._____CONTRACT NO._____
FINAL ACCEPTANCE DATE:_____
END OF PERFORMANCE AGREEMENT DATE:_____
NAME OF FIRM:_____
ADDRESS OF FIRM:_____
TELEPHONE NUMBER:_____
CONTRACTOR'S SIGNATURE:_____
PRINTED OR TYPED NAME:_____DATE:_____
CONTRACTING OFFICER'S SIGNATURE:_____
PRINTED OR TYPED NAME:_____DATE:_____

END OF SECTION

DIVISION 8

SECTION 08000 - GENERAL INFORMATION

A. When developing specifications for this section, refer to the Fairchild Air Force Base Design Standards sectional information developed by the 92d Civil Engineer Squadron Engineering Flight.

B. Window glass shall be of high quality, performance glazing.

C. Window frames shall be anodized aluminum with a dark bronze, finish.

D. All facilities that serve the public shall have automatic hardware @ entry doors along the accessible route of travel..

E. "Balance" doors (with offset pivot hinges) shall be allowed, but only when such doors are 48" in width or wider.

END OF SECTION

DIVISION 8

SECTION 08700 - DOOR HARDWARE

A. Locksets, Latchsets, and Deadbolts

1. The designer shall write the specifications to include the following:

   Locksets, latchsets and deadlocks shall be heavy-duty weight. To the maximum extent possible, all locksets, latchsets and deadlocks shall be from the same manufacturer, and of matching style, finish, color, etc. All key operated locks shall be compatible with the Best Lock Corporation "BEST" interchangeable cores.

2. The keying schedule shall be developed by the designer and be included in either the project specifications or project drawings.

3. Lock cores shall be specified as follows:

For Base Contracted Projects:

The contractor shall provide seven pin "BEST" "R" keyway cores (no substitutes) keyed to the Base Best Grandmaster Key controlled system. Final "pinned" cores and keys shall be purchased from "BEST" by the contractor and shipped to the base locksmith so that they are received prior to Substantial Completion. The base will install the final cores and return the construction cores to the manufacturer.

For Corps of Engineers (CoE) Contracted Projects:

Construction cores shall be provided by the contractor and in-place prior to Substantial Completion. The CoE shall MIPR funds to the base a minimum of 90 days prior to Substantial Completion so that the BCE can purchase “BEST” cores. The keying schedule shall still be prepared by the designer and included in the either the specifications or drawings, however, it will be annotated with a note that says “Final cores to be provided by the government”.

END OF SECTION

DIVISION 9

SECTION 09000 - GENERAL INFORMATION

A. All interior and exterior finishes are in various AMC Design Guides and the FAFB Architectural Compatability Guide (ACG). Copies of these documents can be checked out by hand receipt from the Engineering Flight, 92 CES/CEC.

B. Fairchild Air Force Base has adopted the "Affirmative Procurement Plan" dated August 1999 regarding recycling and conserving resources. The Plan requires that some construction materials, such as:

carpet (made of polyester fiber) for use in low- and medium-wear applications,
floor tiles containing recovered rubber or plastic
reprocessed and consolidated latex paint for specific uses,

be composed of a minimum percentage of recycled products. It is therefore mandatory that designers obtain a copy of the Plan from the Contracting Officer in order to familiarize themselves with the requirements related to developing specifications for the particular product, possible exemptions allowed, and required documentation for both the design analysis and the construction phase.

C. Exterior Paint and Finish

1. Applies to all base facilities including commercial/industrial buildings, flightline facilities, and administration complexes.

2. Follow AMC Design Guides and ACG.

3. Specific Guidance

a. Two exterior colors shall be used. Generally, they shall be:

(1) Federal Standard 595a color no. X3578, "Antique Linen"

Split faced, normal weight block colors to meet Antique Linen requirement are White Block Color No. FC-569W and Layrite Color No. W-75. Antique Linen colors from other suppliers will require samples for Government approval as equals to those listed.

(2) Match Sherwin-Williams' color "Spanish Moss" #SW2070.

b. Body color shall be “Antique Linen”. Roofing, fascia and trim shall be ”Spanish Moss”. Downspouts shall be “open” type with both exterior and interior surfaces (exposed to view) colored to match adjacent facility surface color.

c. Doors, door trim and window trim shall be bronze or “Spanish Moss.”

d. Exterior paint type (latex, acrylic, etc.) and paint finish (flat, semi-gloss, gloss) shall be determined by the Design Guides.

e. The use of markings, symbols, or signs on buildings is prohibited unless they are part of the approved building paint scheme. No super graphics are authorized on the exteriorof facilities.

f. Miscellaneous.

(1) Exterior HVAC and electrical equipment, ducts, pipes, fire hydrants and architectural features on or near facilities shall be made "invisible" by painting them to match the adjacent facility surface color. If not near the facility (as determined by the Government), items shall be painted “Spanish Moss”. Landscaping shall also be used when appropriate to reduce visibility of these items.

(2) Exterior handrails for administrative facilities shall be brushed aluminum, anodized dark brown, or nylon tubes without lengthwise seams, colored dark brown throughout, fitted over a continuous galvanized steel core, and shall not be painted steel. Handrails in industrial areas shall be steel painted “Spanish Moss.”

(3) All trash bins are to be painted “Spanish Moss.” Approved trash receptacles shall be allowed outside buildings if required.

(4) Utility cabinets, HVAC equipment, trash bins shall be screened in accordance with ACG.

D. Interior Finish

1. Compatibility: Interior design compatibility at Fairchild AFB shall be a cohesive approach to coordination of interior materials, construction details, finish colors and furnishings. This requirement is intended to include fire extinguisher cabinets.

2. Ceiling tile shall be 2’ x 2’ with reveal edges.

3. Color: Follow AMC Design Guides and ACG.

4. Specify Class V for all wall with semi-gloss paint.

5. Specify special sealer for all gypsum wallboard composed of recycled products.

6. Specify penetrating sealer for all grouted floor tile systems at kitchens and bathrooms.

7. All exposed surfaces, including (but not limited to) ductwork, conduit, grilles, diffusers, piping (sprinkler, water service, drainage, etc.), and equipment shall be painted to match color, texture and finish of adjacent surfaces. Unless factory finish is suitable (as determined by Government) or specific exceptions are called out in the specifications.

8. Painted CMU is not acceptable as an interior finish except in mechanical areas.

END OF SECTION

DIVISION 10

SECTION 10000 - GENERAL INFORMATION

A. When developing specifications for this section, refer to the Fairchild Air Force Base Design Standards sectional information developed by the 92d Civil Engineer Squadron Engineering Flight.

B. Fairchild Air Force Base has adopted the "Affirmative Procurement Plan" dated August 1999 regarding recycling and conserving resources. The Plan requires that some construction materials, such as **shower and restroom dividers/partitions containing recovered steel or plastic**, be composed of a minimum percentage of recycled products. It is therefore mandatory that designers obtain a copy of the Plan from the Contracting Officer in order to familiarize themselves with the requirements related to developing specifications for the particular product, possible exemptions allowed, and required documentation for both the design analysis and the construction phase.

END OF SECTION

DIVISION 10

SECTION 10425 - SIGNS

A. General: For all signage, refer to "AMC Exterior Sign Standards" dated 08 August 2000 in conjunction with Air Force "Sign Standards Pamphlet," AFP 32-1097.

1. Building Signs: All new facilities shall have signs of the following description:

    a. Main Base building identification signs shall be Charleston Industries, Inc., Architectural Signage Systems, Series 325 Post and Panel System, Standard Design. General layout shall be similar to the Type B2 sign in AFP 32-1097, but with the following modifications:

        1. Size shall be 30" x 42"
        2. Either single-faced or double-faced copy shall be provided depending on orientation.
        3. Emblem shall be the AMC shield.
        4. The street address shall be provided in lieu of the facility number in the lower section.
        5. Lettering shall be "White" Scotchlite Reflective Sheeting manufactured by 3M.
        6. Background shall be "Park Service Brown" Scotchlite Reflective Sheeting manufactured by 3M. Back face of sign shall be "Park Service Brown".
        7. The top section shall be 7", the middle section shall be 17", and the bottom section shall be 6".
        8. Rules shall be ¼" thick "White" Reflective Sheeting.
        9. Posts shall be 2 ½" x 3 ¼" x 8' with 2' by in a 12" dia x 3' deep concrete footing. Post color shall be "Park Service Brown".

2. Design proposals for all signs (other than the type mentioned above) shall be submitted to Base Civil Engineering's Architectural Review Board for approval prior to any implementation.

END OF SECTION

DIVISION 11

SECTION 11000 - GENERAL INFORMATION

THIS DIVISION CONTAINS NO REQUIREMENTS SPECIFIC TO FAIRCHILD AIR FORCE BASE. USE AIR FORCE INSTRUCTIONS (AFIs), MILITARY HANDBOOKS (MIL-HDBKs), ENGINEERING TECHNICAL LETTERS (ETLs), CONSTRUCTION TECHNICAL LETTERS (CTLs), CIVIL ENGINEERING TECHNICAL SUPPORT OFFICE (CETSO) LETTERS, AIR MOBILITY COMMAND (AMC) COMMANDER'S GUIDES, AND OTHER DESIGN DIRECTIVES ESTABLISHED BY THE AIR FORCE, IN COORDINATION WITH MASTERSPEC STANDARD SPECIFICATIONS WHEN DEVELOPING SPECIFICATIONS FOR THIS DIVISION.

END OF SECTION

DIVISION 12

SECTION 12000 - GENERAL INFORMATION

THIS DIVISION CONTAINS NO REQUIREMENTS SPECIFIC TO FAIRCHILD AIR FORCE BASE. USE AIR FORCE INSTRUCTIONS (AFIs), MILITARY HANDBOOKS (MIL-HDBKs), ENGINEERING TECHNICAL LETTERS (ETLs), CONSTRUCTION TECHNICAL LETTERS (CTLs), CIVIL ENGINEERING TECHNICAL SUPPORT OFFICE (CETSO) LETTERS, AIR MOBILITY COMMAND (AMC) COMMANDER'S GUIDES, AND OTHER DESIGN DIRECTIVES ESTABLISHED BY THE AIR FORCE, IN COORDINATION WITH MASTERSPEC STANDARD SPECIFICATIONS WHEN DEVELOPING SPECIFICATIONS FOR THIS DIVISION.

END OF SECTION

DIVISION 13

SECTION 13000 - GENERAL INFORMATION

A. When developing specifications for this section, use the Fairchild Air Force Base Design Standards sectional information developed by the 92d Civil Engineer Squadron Engineering Flight.

END OF SECTION

DIVISION 13

SECTION 13851 - FIRE ALARM

A. GENERAL

1. The following information is being supplied to assist in the design of the project. It is not intended to be a complete specification.

2. Fire detection shall be provided where required by NFPA.

3. Kitchen equipment shall be provided with either wet chemical extinguishing or Gaylord (or equal) water fire suppression systems interconnected to shut down the gas and/or electrical power to griddles and deep fat fryers. Provide exhaust fans. Interconnect into the fire alarm panel to sound alarm.

4. Require submittal of the fire alarm systems and shop drawings proposed by the designer and contractor for approval prior to installation.

B. FIRE DETECTION/LOCATIONS

1. Detectors shall be provided in all areas, including below suspended ceilings, occupied and unoccupied spaces, attics, rooms, halls, sleeping rooms, stairways, storage areas, closets, basements, lofts, dumb-waiter shafts, chutes, utility crawl spaces, and subdivisions.

2. Fixed temperature heat detectors shall be provided in areas below the ceiling where a rapid change in temperature would cause fixed temperature/rate of rise detectors to falsely activate.

3. Fixed temperature heat detectors shall be required above the ceiling (that are accessible) in areas that construction is combustible, utility crawl spaces; mechanical, utility, and electrical rooms.

4. If above-ceiling areas are used for storage, detection is required.

5. Smoke detectors shall be hard wired in sleeping rooms for individual occupant notification. Detectors shall be provided in hallways outside sleeping rooms and rooms housing large electronic equipment and areas where smoke development is possible,eg. paper storage.

6. Detection throughout the facility is required for preaction sprinkler systems.

C. FIRE ALARM SYSTEM STYLE

1. Fire alarm system components and wiring shall meet specification, and performance and capabilities of initiating device and signaling line circuits of Style "D".

D. BELLS AND STROBES

1. Strobes shall produce 60-100 flashes per minute and lenses shall indicate "FIRE".

2. Bell and strobe devices shall be one unit.

3. Specifications shall call for bells and strobes with white base plates. When base plates supplied are other than white, theyshall be painted to match adjacent wall color.

E. MANUAL STATIONS

1. Shall be noncoded located.

2. Devices shall be red, single action pull stations withkeylock for reset and testing WITH NO GLASS RODS OR BREAK GLASS DEVICES.

F. BATTERIES

1. All batteries necessary to maintain the fire alarm control panel and transmitter shall be gel-type.

G. FIRE ALARM CONTROL PANEL

1. The panel shall include AC primary power and 24V DC battery backup with a charger.

2. The panel shall be zoned to accommodate all fire areas with two complete spare zones.

3. All zones shall betied into the BT2 transceiver separately. The fire department shall provide the number of Zone Identifiers (ZIDS) and ZID numbers.

4. The fire alarm and transmitter/transceiver panels shall be located in the electrical room, or (secondary) the mechanical room, unless otherwise indicated and approved on submittals.

5. An M-1 Integrated Radio Transceiver and fire alarm control panel may be installed in place of a separate fire alarm and transceiver panels. If so, it shall be a 4 class B or 2 Class A zones, expandable, in enclosure, 32 class B or 16 class A zones.

H. ANNUNCIATOR PANEL

1. When a building is divided into four or more zones, a graphicannunciator panel constructed of engraved phenolic or metal materials shall be provided at a location determined by 92d Civil Engineer Squadron Contract Development (CECC). Annunciator panels shall be located to allow easy access yet shall not be located so as to detract from the aesthetic appearance of a facility.

2. Each zone shall clearly indicate the location of the area that is in alarm or trouble. LED's shall indicate red for alarm and yellow or amber for trouble.

3. The graphic annunciator shall be designed to the layout of the facility, including each floor if it is multi-story, and be situated in a manner so that when observed, the actual building configuration is seen with a "You are Here" arrow.

4. The panel shall only have an LED test device. No silence or reset capability.

5. Annunciator panels shall be recessed into the wall and have a dark bronze-anodized aluminum face panel with a dark bronze-anodized aluminum frame.

I. TRANSCEIVER (TRANSMITTER)

1. The transceiver shall be a Monaco Radio Alarm System Transceiver or approved equivalent and be capable of transmitting a Zone Identification (ZID) to the Monaco D-500 Plus VHF Radio Alarm System located in the fire stations (FM frequency 138.925). Depending on the fire alarm panel zoning, the following shall apply:

   a. 5 Zones or less: BT 2-3 Building Transceiver, 4 Watt.

   b. 6 to 16 Zones: BT 2-4 Building Transceiver, 16 Zones.

   c. 17 to 32 Zones: BT 2-4 Building Transceiver, 32 Zones.

2. With the following applicable hardware or equal:

   a. Antenna, ground plane, fixed station, cut to frequency.

   b. Antenna Bracket (depending on preferred mounting):

      (1) Lightning arrester kit.

      (2) Raintight enclosure for lightning arrestor.

      (3) Coaxial cables with connectors, Type I (from lightning arrestor to transceiver):

      (4) Coaxial cable with two PL-259 connectors, Type 2 (from antenna to lightning arrestor).

      (5) If the existing or new fire alarm panel (FAP) does not have Class-C (dry) contacts, an interface is needed between the FAP and the building transceiver:

         (a) RT-100 Remote Transmitter Interface Panel, 24 Vdc (UL listed).

3. Remote radio transceivers shall include a radio receiver and transmitter to allow an interrogation/reply technique in which the transceivers are interrogated at regular time intervals automatically, as well as manually by the operator from the central supervising

radio equipment, and replies are returned by the transceivers indicating transceiver status. Transceivers shall be crystal controlled for operation on any selected frequency in the 132 to 174 MHz band. Transceivers shall be operable within a 25KHz channel. The specific operating frequency shall be assigned by CEC, within 90 days after submission of completed Application of Frequency Allocation following contract award. Radio alarm transceivers shall, without exception, meet or exceed the following requirements.

4. Each radio transceiver shall provide electrically supervised connections to local fire alarm control panels, sprinkler system flow devices and such other alarm and supervisory devices as indicated herein or on the drawings. Each transceiver shall provide electrical supervision for both open and ground conditions on interconnection wiring between the transceiver and local fire alarm control panel, interface panel or other alarm supervisory device. Where existing local control panels or devices do not provide isolated contract arrangements for transmission of alarm and trouble signals, an appropriate interface device will be provided to maintain system supervision in accordance with NFPA requirements. Where local fire alarm control panels do not provide a supervised alarm output for operation of interface panels, interface panels shall be located within three (3) feet (900 mm) of the fire alarm control panel and all interconnecting wire shall be in conduit.

5. Environmental Operating Requirements: Transceivers shall be designed for reliable operation in an ambient temperature range of minus 30 degrees Celsius to plus 60 degrees Celsius (minus 22 degrees Fahrenheit to plus 140 degrees Fahrenheit) and under adverse climatic conditions including 100 mph (160 km/h) winds, high humidity, rain, ice and snow storms.

6. RE Power Output: Transceiver output shall be a minimum of one watt or as required for reliable reception over long distances.

7. The restoration of zone alarm or trouble signal to normal condition shall result in a restoration signal being transmitted by the transceiver which indicates the return of the zone to normal supervisory condition. Restoration of the alarm or trouble signals shall extinguish the associated zone indicator.

8. Memory: Transceivers shall have full memory capability. Simultaneous or subsequent actuation of any individual message (from zones not initially in alarm) including those actuated during "off air" periods, shall not result in the loss of any message. All such messages shall be stored until they are transmitted.

9. Transmission Confirmation: Each transceiver shall produce an audible or visual indication that the transceiver is operating and signal is being sent.

10. Automatic Transceiver Test: Radio transceivers shall respond to test interrogation from the central supervising station. Upon receiving an interrogation signal, the radio transceiver shall return a message to the central supervising station indicating transceiver status. Any off normal conditions of the transceiver including AC power failure, low battery, tamper (if utilized), zone alarm or zone trouble shall be displayed at the central supervising station as a result of the test interrogation.

11. Battery Supervision: Each transceiver shall constantly monitor and supervise its battery power supply. A low battery message shall be transmitted when battery voltage under load falls below 85 percent of the rated battery voltage, but in any case prior to the point at which the battery will fail to operate the transceiver. This message shall be included as part of every subsequent interrogation reply until the problem is corrected.

12. Trouble Supervision: Disarrangement of the transceiver wiring which prevents proper operation of the transceiver, or the abnormal position of any switch shall cause transmission of a trouble message identifying the trouble condition.

13. Transceiver Power Supply: Each transceiver shall be powered by locally available 120 VAC power. Upon loss of AC power, the transceiver shall automatically and instantaneously switch to standby battery power, without loss of any alarm signal. Loss of AC power shall also activate an indicator and cause an AC failure message to be transmitted if power is not restored within 1 minute. Upon restoration of AC power, transfer back to AC operation shall also be automatic. Power supply filtering shall prevent false message transmissions caused by transient or steady- state electrical disturbances.

14. Battery Power Supply: Batteries shall be spillproof, sealed lead acid or lead calcium. The battery package shall be capable of supplying all power requirements of the transceiver. Transceiver standby battery capability shall provide sufficient power to operate the transceiver in a normal standby status for a minimum of 24 hours and be capable to transmitting an alarm signal at the end of the period. Batteries shall be located within the transceiver housing.

15. Converter/Float Charger: Under presence of 120 VAC power, transceiver batteries shall be charged through a Convertor/Float charge. Charger shall recharge a fully discharged battery in no more than 48 hours while the transceiver is operating under normal conditions (presence of 120 VAC power).

16. Transceiver Housing: Housing shall be corrosion resistant metal, conforming, as a minimum, to NEMA 12. Provision shall be made for conduit (minimum 3/4 inch I.D. or 20 mm) entry and attachment at no less than two places on the housing. Switches and any other controls shall not be accessible without the use of a key. Housing shall be factory painted with a priming coat and not less than two coats of a durable weatherproof enamel. The finish color shall be manufacturer's standard. Repaint all surfaces damages during installation to match existing paint.

17. Lock: Internal components shall be protected from vandalism by a lock on the transceiver housing door. Locks for all transceivers provided shall be keyed alike, see paragraph on keys.

18. Antennas and Cables: Building mounted antennas may be omnidirectional or directional (as appropriate) with a driving point impedance of 50 ohms. All antennas shall be installed external to buildings and shall be located in accordance with manufacture recommendations. Antenna and antenna mounts shall be designed to withstand wind velocities of up to 100 mph (160 km/h). Each transceiver shall have its own antenna. Antennas shall be of non-corrosive materials and of strengths suitable to withstand ice and wind loading

conditions and shall be located well away from overhead power circuits. Coaxial cables shall be RG type (or equivalent) and shall include PL and BNC type fittings or connectors as appropriate.

19. Lightning Protection: All antennas shall be provided with coaxial lightning arrestors located outside of the building and connected to the antenna grounding system. Lightning protection shall be installed in accordance with NFPA 70. Transceivers shall not exhibit mis-operation or failure when electrical transient per IEEE Standard 587 Category B are applied to the AC power line.

20. Moisture Protection: Printed circuit boards in transceivers and interface panels (if provided), shall be coated with a coating for the climate in which the equipment is to operate and shall be applied in accordance with the coating manufacturer's specifications.

21. Location: Radio transceivers shall be installed in locations easily accessible for maintenance.

22. Input/Connections: Each transceiver shall provide a minimum of 4 alarm circuit inputs (zones) for the purpose of connection to the local fire alarm control panels, sprinkler water flow detectors, manual pull stations and extinguishing system control panels, utilizing Form A dry contacts. The specific zone qualifies for each building shall be as shown and where additional zones are required they shall be provided.

23. Programming: Radio transceiver shall provide a means for programming zone and transceiver identification in the field without the use of tools. Transceivers shall be designed to allow complete interchangeability and reprogramming of transceiver identification in the field without additional parts or equipment.

24. Electrical Supervision: Each transceiver shall electrically supervise all wiring between the transceiver and local fire alarm control panel. Transceivers shall also supervise the wiring to initiating devices where such devices are connected directly to the transceiver in lieu of being connected to a local fire alarm control panel. A ground fault condition which prevents transmission of an alarm or a break or open condition in any of the above circuits shall cause a trouble condition which shall initiate transmission of a trouble message identifying the affected zone.

25. Message Designation: In addition to test replies and zone alarm, trouble and restoration transmissions, each transceiver shall provide a separate identifiable transmission for the following conditions: AC FAILURE; LOW BATTERY; and TAMPER. Each transmission shall be coded to indicate the transceiver identification.

26. Zone Annunciation: Transceivers shall have separate alarm and trouble lamps to indicate the status of each initiating zone.

27. AC Power Source: AC power shall be obtained from a single connection into the line side of the building's regular 60 Hz AC service, through a lockable fused disconnect switch. Where a local energy fire alarm control panel is fed by the same arrangement, a common feed to both the local panel and the transceiver is permitted.

28. Interface Device/Panel: At the manufacturer's option, all circuitry, and controls necessary for the functions required for Radio Transceivers may be contained in one housing or in two separate housings. If two separate housing are utilized, all requirements for radio transceivers as stated herein remain in effect.

J. KEYS

1. All panels and device locks will be keyed alike. They shall be either a Corbin B or a C-415A key to match Fairchild AFB (FAFB) fire alarm system Master Plan. Copies of these keys will be made available by the Fire Prevention section to meet this requirement upon request of the contractor. Two keys will be provided for each individual locking device.

K. FIRE ALARM POWER

1. Power for the fire alarm control panel shall be connected to the main electrical service ahead of the distribution panel. Connections to the power service shall be on a dedicated circuit with circuit and connections mechanically protected. The circuit disconnect shall be accessible only to authorized personnel and shall be clearly marked FIRE ALARM CONTROL CIRCUIT. Ref: NFPA 70, para 230-82 and 230-94; NFPA 72, para 5-4.2

L. SPRINKLER SYSTEM INTERCONNECTION

1. The sprinkler systems shall indicate an alarm and trouble condition on both the fire alarm control and annunciator panels.

M. SUPERVISION

1. Tamper switches shall be provided for all post indicator and OS&Y valves to indicate a trouble condition in the event the valves or tamper switch covers are shut off or removed.

N. WET PIPE SYSTEMS

1. An electronic water flow switch (vane paddle type) shall be installed for the purpose of indicating a fire condition and be adjustable to delay the signal to the fire alarm panel up to at least one minute.

O. CONTRACTOR WELDING REQUIREMENTS

1. Facility projects which involve welding shall include the following paragraphs in the specifications:

   a. No welding/cutting and open flame operations are allowed in facilities when automatic fire detection systems are out of service.

   b. Automatic fire detection systems are returned to service (if possible) during construction and renovation projects when the facility is unoccupied.

c. Contractor/user posts a fire guard for 24 hours (or certifies the facility fire safe) after welding/cutting and open flame operations in facilities when:

(1) Fire detection/sprinkler systems cannot be returned to service.

(2) Fire detection/sprinkler systems do not exist.

END OF SECTION

DIVISION 14

SECTION 14000 - GENERAL INFORMATION

A. Specifications shall require contractors installing elevators to include a 1-year service and maintenance agreement included in the construction contract for all new elevators. (This is in addition to the standard, one-year construction warrnanty).

END OF SECTION

DIVISION 15

SECTION 15000 – GENERAL INFORMATION

A. General Design Requirements

1. Provide mechanical systems with electronic direct digital control by interfacing existing FAFB central Energy Management and Control System (EMCS). Refer to Section 15970 of these Design Standards.

2. Provide meters for electric power, water, natural gas, and steam condensate and insure connection with the EMCS.

3. Operations and maintenance manuals shall be furnished for all mechanical systems (as part of the overall O&M manual requirement.)

4. Designs shall include a 24-hour heat/cooling load profile for the facility together with a profile of energy consumption requirements.

5. Fairchild Air Force Base has adopted the "Affirmative Procurement Plan" dated August 1999 regarding recycling and conserving resources. The Plan requires that some construction materials, such as **cement and concrete (including products such as pipe and block) containing fly ash or ground-granulated blast furnace (GGBF) slag**, be composed of a minimum percentage of recycled products. It is therefore mandatory that designers obtain a copy of the Plan from the Contracting Officer in order to familiarize themselves with the requirements related to developing specifications for the particular product, possible exemptions allowed, and required documentation for both the design analysis and the construction phase.

B. Steam Plant and Distribution System

1. Fairchild's main base area is served by a central steam plant consisting of four boilers which operate on natural gas or #2 fuel oil. Another natural gas/#2 fuel oil steam plant is located adjacent to the base hospital. The hospital plant is used to backfeed the main base during periods when the main plant is shut down for annual maintenance. The Deep Creek/Survival School area of the base is heated from a separate steam plant which also operates on either natural gas or #2 fuel oil. Most of base housing is now heated by natural gas furnaces; however, some of the units are still heated with #2 fuel oil furnaces.

2. Steam piping shall be schedule 40 and condensate piping shall be schedule 80. All fittings and equipment shall be 250 psig (1825 kPa) rated.

3. The steam distribution system shall be a pre-engineered, insulated conduit system, utilizing steel conduit,for direct burial.

4. The FAFB standard steam pit design (see attached details at the end of this section) shall be used for all new steam distribution pipelines and systems.

C. Natural Gas

1. Natural gas is supplied by Avista Utilities under firm and interruptible rate schedules. The on-base distribution system operates at 30 psig (308 kPa). The system is a combination of steel and polyethylene lines buried at a depth of approximately 30 inches (800 mm). It is recommended that any connections to the steel lines be investigated to check for corrosion prior to final design or any construction. Future major additions to the system shall be sized and planned to provide a natural gas grid system for the base.

D. Facility HVAC Systems

1. General

a. Training and instruction will include adjustment, operation, and maintenance, including pertinent safety requirements of the equipment and systems specified. Orient the training specifically to the system installed. Instructors shall be thoroughly familiar with the subject matter they are to teach. Training manuals shall be provided which describe in detail the data included in each training program. The manuals shall also include an agenda and defined objectives for each lesson. Training and O&M Manuals shall be provided no later than 10 days prior to the scheduled training. Training presentations will be mandatory and videotaped in a professional manner. Unplanned, impromptu sessions recorded on videotape do not constitute an acceptable training video program.

2. Mechanical Systems Siting and Room Layout

a. All mechanical equipment shall be sited within the mechanical room or on-grade outside the facility (no rooftop installations). When located outside, pad-mounted heat exchangers and compressors shall be screened in accordance with the FAFB Architectural Compatibility Guide (ACG).

b. Mechanical rooms shall be designed to provide maintenance personnel the space necessary to service the installed equipment and perform major system overhauls efficiently.

c. Free space shall be provided to allow easy removal of fan shafts from air handling units, tube bundles from steam convertors, changing of air filters, and other large items without removal of another system.

d. Floor slab for mechanical rooms shall have minimum slope of 1% and be provided with appropriate floor drain.

e. All thermometers and other gauges shall be mounted to provide unobstructed view of dial face.

f. Condensate overflows and pressure reliefs shall be piped to within two (2) inches (50 mm) of floor drains and directed to allow any flows to dispose properly without creating excess liquid ponding.

g. A copy of the mechanical and HVAC schematics shall be plexiglass-covered, framed, and mounted in the mechanical room.

h. All conduit and/or piping shall be fed to equipment from overhead.

i. All piping systems for heating and cooling shall employ reverse return layout.

j. Air handling units with heating/cooling coils shall includeair blending sections to thoroughly mix the air and preclude coil freezing and other control problems with the system.

k. The ventilation for HVAC systems shall be based on CO2 demand control, unless special circumstances require additional methods of control.

3. Heating Systems

a. Heat Sources: Fairchild AFB currently uses a central steam plant and a distributed natural gas system. All new facility and heating system renovation projects shall employ the distributed natural gas system (except under extreme circumstances which will be reviewed by 92CES/CECC on a case-by-case basis). The development of the new distributed gas system is described in an extensive study, the FAFB Heating Systems Energy Analysis, a report which will be made available to designers.

(1) Boiler Piping: Where individual boilers for hot water are to be employed, provide a close-coupled boiler circuit and pump to remain hot to protect the boiler from cold water shock, together with a system circuit and pump to service the coils in the system. The system circuit and pump shall be capable of being reset based on outside air temperature by means of three-way valves. The water from the system circuit will be blended into the boiler circuit so as to maintain a hot circuit at the boiler.

b. Steam:

(1) The central steam system provides 160 psig (1205 kPa) saturated steam. Morphaline and Cyclohexamine are added to the steam as it leaves the boiler to provide corrosion protection for the distribution system. As such, steam cannot be used directly where it will be in contact with food or ventilation air. The distribution system utilizes a pumped condensate return; therefore, duplex condensate return pumps are required for all systems.

(2) Steam pressure reducing stations shall be utilized to reduce the working pressure to 5 psig (136 kPa). The reducing station shall be piped so that removal of a

component of equipment shall not require the removal of other equipment items or more than two fittings.

(3). Where steam from the central distribution system is used for the domestic hot water system, a backup energy system shall be provided for periods of distribution system shutdown. Except for emergencies, this shutdown is typically for 2-3 weeks per year in the summer. Certain remote facilities with low summer usage are shut down all summer. The available alternatives are:

(a) Single heater combination steam/electric or gas

(b) Two heaters; one of them to be gas

(c) Single heater, electric or gas (only for small applications)

4. Cooling Systems

a. Air cooled condensing units are preferred over cooling towers unless life cycle cost considerations for large projects indicate a large economic advantage in using cooling towers.

b. Class I ODS (ozone-depleting substances) shall not be specified as refrigerants in HVAC equipment. All new equipment may employ Class II ODS refrigerants where the equipment is not expected to be in service after the year 2020. All new equipment that is expected to remain in service after the year 2020 will be selected jointly by the designer and FAFB on a case by case basis to assure the use of the best available technology, which may include Class II ODS or HFC refrigerants.

E. Cathodic Protection

1. All metallic underground utility lines and storage tanks shall be installed with appropriate cathodic protection. The preferred method is impressed current; however, sacrificial anodes may be used as design conditions dictate.

2. Soil Resistivity varies widely across the base, therefore measurements of the soil resistivity certified by a National Association of Corrosion Engineers (NACE) engineer shall be taken before designing any new projects involving metallic objects. Cathodic protection shall be provided for all buried metallic structures and piping.

3. Refer to Division 16, Section 16660 - Corrosion Control in the Fairchild Base Design Standards for further information on Cathodic Protection.

F. Sprinkler Fire Suppression Systems - General

1. System shall indicate an alarm and trouble condition on both the fire alarm control and annunciation panels.

2. Supervision: Tamper switches shall be provided for all post indicator and OS&Y valves to indicate a trouble condition in the event the valves or tamper switch covers are shut off or removed.

3. A one inch inspection test shall be located at the most remote branch line and easily accessible.

4. The 2-inch (50 mm) drain shall be at the riser and piped to the outside.

5. Sprinkler heads shall be flush-mounted and inconspicuous. Hose connections (FDC's) outside buildings are required.

6. Fire equipment cabinets shall be keyed alike.

G. Fire Hydrants

1. Fire hydrants shall be located according to codes, but designer shall avoid locating near any FAFB main facility entrance.

2. A/E shall verify fire hydrant pressures and flows prior to design of facilities' protection system. This data shall be included in the RD (Requirements Document) submittal.

H. Contractor Welding Requirements. See Division 13, Section 13851.

I. Utility Requirements

1. No gas regulators, transformers, exterior HVAC, fire hydrants, etc. shall be provided at entryways to facilities.

2. Exterior equipment such as bollards, gas regulators, transformers, exterior HVAC, fire hydrants, etc. shall be painted to match Sherwin-Williams color #SW 2070, "Spanish Moss", when located in open areas or adjacent to brick facilities. Exterior equipment such as bollards, gas regulators, transformers, exterior HVAC, fire hydrants, etc. shall be Federal Color Standard 595A, Color X3578, Antique Linen, when located adjacent to Antique Linen colored facilities.

3. All underground utilities (steam and gas lines) shall be placed parallel to roads/streets within a 50 feet (15 meter) corridor. Service connections shall generally be installed perpendicular to mains. Avoid crossing large developable spaces.

4. All utilities shall be metered at building entrance/mechanical room and all services shall be marked and identified.

5. Bollards shall be installed to protect fire hydrants when it is necessary to provide fire hydrants in parking lots. However, the preferred location is adjacent to the facility (see note I1, this section.) Split block/brick fence (see standards herein) shall be installed to protect/shield all gas regulators, transformers, exterior HVAC, back flow preventers, etc. from vehicle damage and as a vision screen.

6. In addition to the backflow preventer required at the water service entrance to buildings, internal backflow preventers are required at boiler make-up connections and any other source of potential contamination of the building water system.

END OF SECTION

DIVISION 15

SECTION 15325 - STANDPIPE AND SPRINKLER SYSTEMS

A. General Design Requirements

1. Water for fire protection shall be taken from the base water distribution system.

2. The entire facility shall have an automatic fire detection and/or sprinkler fire suppression system.

3. 92d Civil Engineer Squadron Contract Development (CECC) shall require submittal of the sprinkler and fire alarm systems and shop drawings proposed by the designer and contractor for approval prior to installation.

4. No gas extinguishing systems using Halon or similar CFC materials shall be used. Refer to BDS General Base Data section for additional information.

B. Applicable Publications

1. Factory Mutual Systems (FMS) publication:

2. Factory Mutual Approval Guide

3. Uniform Building Code (UBC)

4. National Fire Protection Association (NFPA) standards; National Fire Codes (NFC); Life Safety Codes (LSC):

NFC 10	-	Portable Fire Extinguisher
NFC 13	-	Installation of Sprinkler Systems
NFC 17A	-	Wet Chemical Extinguishing Systems
NFC 70	-	National Electrical Code
NFC 72	-	Installation, Maintenance, and Use of Protective Signaling Systems
NFC 72E	-	Automatic Fire Detectors
NFC 72G	-	Installation, Maintenance and Use of Notification Appliances for Fire Protective Signaling Systems
NFC 90A	-	Installation of Air Conditioning and Ventilation Systems
NFC 90B	-	Installation of Warm Air Heating and Air Conditioning Systems
LSC 101	-	Safety to Life from Fire in Buildings and Structure

NFC 172 Symbols for Architectural and Engineering Drawings

5. Laboratories Publications. All equipment and devices shall be in accordance with federal specifications and be tested by one of the following:

   Under Writers Laboratories (UL)
   Factory Mutual (FM)
   National Electric Manufacturer's Association (NEMA)
   Institute of Electrical and Electronic Engineers (IEEE)
   American National Standards Institute (ANSI)

6. Military Standards:

   MIL-HDBK 1190 - Facility Planning and Design Guide

   MIL-HDBK 1008B - Fire Protection for Facilities Engineering, Design, and Construction

   ETL-90-9 - Fire Protection Engineering Criteria for Aircraft Maintenance, Servicing and Storage Facilities

   ETL 93-5 - Fire Protection Engineering Criteria - Electronic Equipment Installations

   ETL 94-5 - Fire Protection Engineering Criteria - Emergency Lighting and Marking of Exits

   ETL 94-6 - Fire Protection Engineering Criteria - Removal of Halogenated Agent Fire Suppression Systems

C. Dry Pipe Systems

1. The air system side shall be maintained by an Air Pump: Supervisor Air Panel, Model F112, UL Listed 892A, the pump being a Vacuum-Pressure, Model # 400-1901, manufactured by Barnat Co., Berrington, IL 60010, or equal.

D. Preaction Systems

1. Same air system requirements as S.1 above. The air system shall be maintained at 24 ounces of pressure.

2. The chamber, valves and assembly shall be a Gem Multimatic, Model A-4; a Grinnell Duomatic, or approved equivalent.

E. Testing and Acceptance

1. During acceptance testing, all individual devices shall be tested, eg. manual pull station, heat/smoke detectors, etc.. Each zone shall be tested in a separate trouble and ground fault condition. Exception: One (1) fixed temperature detector per zone shall be tested for an actual activation.

END OF SECTION

DIVISION 15

SECTION 15330 - WET-PIPE SPRINKLER SYSTEMS

A. General Design Requirements

1. Kitchen equipment shall be provided with either wet chemical extinguishing or Gaylord (or equal) water fire suppression systems interconnected to shut down the gas and/or electrical power to griddles and deep fat fryers. Provide exhaust fans.

B. Wet-Pipe Systems

1. An electronic water flow switch (vane paddle type) shall be installed for the purpose of indicating a fire condition and be adjustable to delay the signal to the fire alarm panel up to at least one minute.

2. Water flow pressure switches and retard switches are not required.

END OF SECTION

DIVISION 15

SECTION 15520 - STEAM AND CONDENSATE PIPING

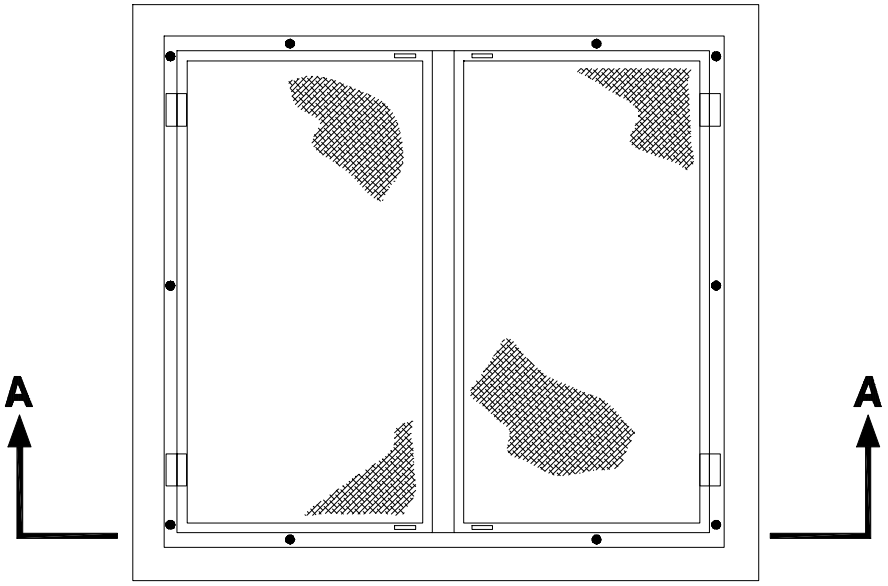
A. General Design Requirements

1. Steam supply piping shall be schedule 40 (suitable for 160 psi working pressure) and condensate piping shall be schedule 80. All fittings and equipment shall be 250 psig (1825 kPa) rated.

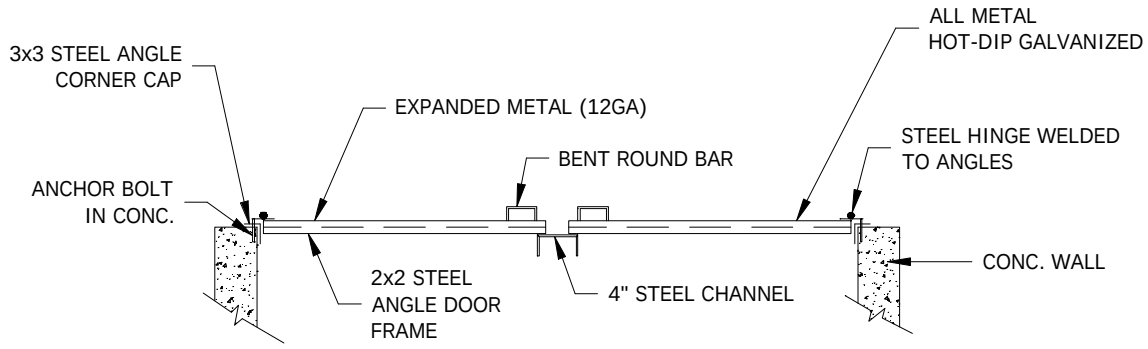
2. The steam distribution system shall be a conduit system, pre-engineered type, utilizing steel conduit, buried underground.

3. The FAFB standard steam pit design shall be used for all new steam distribution pipelines and systems. See drawings at the end of this section.

END OF SECTION



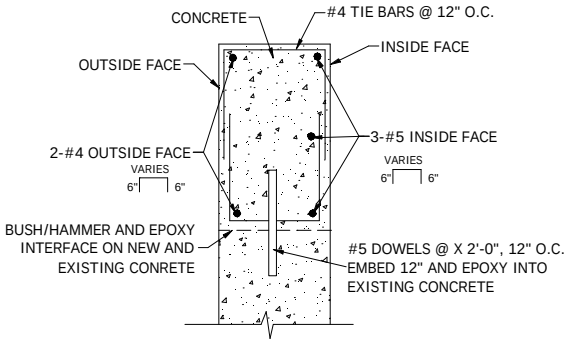
8'x8' PIT



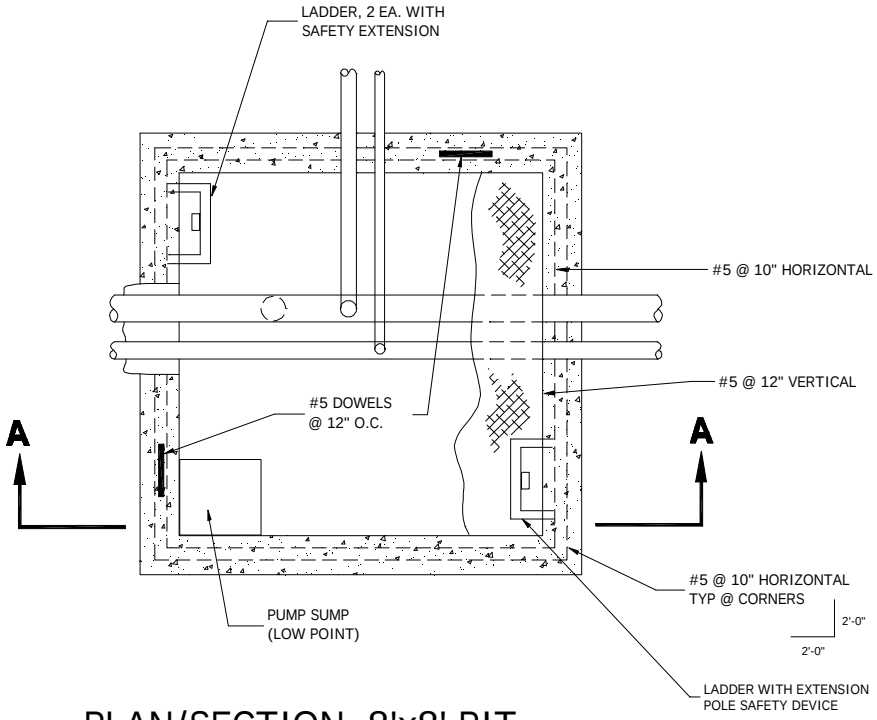
SECTION A - A

1 STEAM PIT ACCESS DOOR

SCALE: NONE



SECTION A-A
TYPICAL BEAM DETAIL



PLAN/SECTION, 8'x8' PIT

2 STEAM PIT

SCALE: NONE

SECTION 15950 – AIR-BORNE GAS DETECTION

A. General Design Requirements

1. All facilities with natural gas-, oil- or LPG-fired equipment or appliances such as furnaces, water heaters, ranges, clothes dryers, fireplaces, etc. are potentially susceptible to Carbon Monoxide (CO) emissions. Therefore, Carbon Monoxide (CO) detectors shall be specified for installation at all new construction and/or renovation projects. Permanent hard-wired CO detectors with a detection element service life of not less than 5 (five) years shall be used.

2. Detectors shall be listed by Underwriters Laboratory to the UL Standard 2034, Single and Multiple Station Carbon Monoxide Detectors, October 1998 Edition. (Detectors manufactured and listed in 1992 and 1996 editions have significant false alarm problems and, more importantly, may not alarm at all under low humidity condition as experienced during the winter heating season.)

B. Where Required

1. Install CO detectors in all Air Force-owned and -leased housing units with natural gas-, oil- or LPG-fired systems. Recommend one CO detector per housing unit near the sleeping areas; units with multiple floors should have installed one CO detector per floor.

2. Install CO detectors in all other facilities in or near rooms housing such equipment or appliances.

C. Other Requirements

1. Contractor installing CO detectors shall provide for the occupant of each housing unit, the manufacturer's instructions regarding operation and proper maintenance of the detectors.

END OF SECTION

DIVISION 15

SECTION 15951 - DIRECT DIGITAL CONTROLS FOR HVAC

A. Energy Management and Control System (EMCS)

1. General

   a. Specification Section 15951, Direct Digital Controls for HVAC, is provided to designers as a master guide specification that includes all the basic requirements for a control system to function within the existing centralized Fairchild DDC framework.

   b. This master guide specification 15951 is required and should be edited for each project in a manner that provides for all the functions and equipment required for the project, while eliminating all functions and equipment not needed for the project.

   c. Sequences of operations guidance are provided and are required on all systems

   d. All installations shall communicate with the central EMCS office and be stand-alone operable for all programmed functions in the case of communications loss with the central computer. Override control of functions shall be possible from the central EMCS computer center. Communications shall therefore include alarm reporting, override control when necessary, and the capability of gathering history summaries on system points.

   e. Provide EMCS control of all systems on the basis of distributed controls using intelligent field interface devices (FID). The existing EMCS systems are an older system by HSQ Technologies, 3A South Linden Avenue, South San Francisco, CA 94080, 1-800-486- 6684, and a newer system based on PC control by Invensys Building Systems, 7222 East Nora, Spokane, WA 99212, 509-892-1121. This Invensys system shall be the system for all new EMCS projects (or an approved equivalent).

2. Facility environmental system control shall be accomplished via the EMCS installation programming and hardware. Do not specify a traditional pneumatic control system installation with an additional requirement for EMCS interface. Controls shall be electronic; sequences shall be executed by the EMCS equipment using Direct Digital Control (DDC) style control of pneumatic actuators. Standard actuators shall be pneumatic input from FID

controlled pulse-width transducers or analog electrical-pressure transducers. Alternative actuators may be specified based upon economic justification.

3. Specifications shall require that all setpoint and similar control parameters be capable of being changed or altered from the EMCS central computer to facilitate trouble shooting. Do not install setpoint values in permanent memory that require a site visit by maintenance personnel for alteration.

4. The following specifications for EMCS equipment shall be employed for all designs.

    a. The equipment shall be Invensys or an approved equivalent that will operate seamlessly with the existing Invensys system. The existing Fairchild AFB Energy Management Control System is used to monitor, schedule, alarm (routed to all workstations and via paging system), program, and trouble-shoot over 10,000 input/output points residing in local control systems located in 56 buildings. An existing server-client network supports technicians in the field for this work. On small projects Fairchild personnel have engineered, programmed, installed, and commissioned control systems without contractor involvement. The installed systems shall be compatible with this objective in the future.

    b. Communications over the Fairchild AFB metropolitan area network at 10 MBS shall be required. Both ThinNet (coax) 10Base2 and Twisted-Pair 10Base-T cabling systems shall be supported. Field access to area controllers and application specific controllers using existing laptops shall be required; to include full access to the entire installed programming. Field technicians shall have the ability to communicate with all area controllers located on the same network from one remote location.

    c. The Network Communications Module that provides Ethernet connectivity for the Area Level Controller must be a dedicated device, specifically manufactured for the purpose. Systems using a Personal Computer or a headless PC (PC in a box) together with communications software as this Ethernet Interface shall not be acceptable.

    d. Existing Server-Client-Paging System: The EMCS shall fully and seamlessly support the existing Operator' s Terminals and the Graphical Engineering Workstation software that is residing on the Fairchild Server-Client-paging Network. EMCS Systems requiring additional operator' s terminals, gateways, or routers shall not be acceptable.

    e. System I/O Points: The EMCS shall be capable to read/write to all points and any user-defined programs on the built-up and application-specific equipment controllers. In addition to the read/write function, the program data bases residing within the equipment controllers must be able to be uploaded to the operator terminals, modified as required , and downloaded as a permanent program at the controller.

    f. Integrator Control Programs: The EMCS shall seamlessly support the existing ICP generation capability of the Graphical Engineering Workstation. Theseexisting ICP are

custom, user-defined control function programs that simplify routine tasks and provide for base-wide system integration.

g. Controller Programming: The EMCS shall incorporate built-up and application-specific equipment controllers that program using point-based programming and line-based programming for specialized applications. Fairchild AFB has selected this programming type for its flexibility, power, and ease of use. EMCS equipment that uses object or block programming shall not be acceptable.

h. Support System: Providers of EMCS equipment shall be local to the Fairchild area and shall be a factory branch office, not a dealer simply brokering a manufacturers product. The local factory branch office shall provide engineering, installation, and system spare parts. All installations shall be made by factory trained and certified technicians.

5. Outside Air Temperature Sensors

a. Outside Air Temperature (OAT) sensors and Relative Humidity (RH) sensors should be installed in a wooden, louvered enclosure and mounted on the north wall of the building, approximately 10 feet above ground level. These sensors are to be sensing actual outside air, not air inside the entrance of a section of ductwork.

b. A sketch of a typical acceptable wooden enclosure is included in Division 02.

6. Submittals

a. Coordinate with FAFB 92 Civil Engineer Squadron Contract Development (CECC) Mechanical Engineering section during design process.

b. As-built and Operations and Maintenance (O&M) Manual information must be available to the EMCS shop through the Contracting Officer 30 working days prior to facility acceptance testing. This stage is crucial to the orderly opening of a new facility.

c. O&M Manual Minimum Content Requirements for EMCS

(1) Flow charts of control sequences shall be provided as a part of the O&M submittal. Each point shall be indexed to show association with the control sequences.

(2) As-built drawings shall show terminal numbers in the EMCS FID and any equipment such as motor starters, air- conditioning compressors, etc.

(3) Catalog cuts included in the O&M Manual shall be marked with indicating arrows to show the specific installed item.

(4) Service and calibration information for all installed equipment.

(5) A detailed contents and format instruction for O&M Manuals is available on request.

7. Installation: Place all equipment in service accessible area such as a locked cabinet in mechanical room. Coordinate placement of cabinets with other crafts requirements.

   a. Remotely located equipment must be readily accessible.

   b. Provide Data Termination Cabinet (DTC) with terminal strips for termination of all conductors prior to bringing conductors to FID. Label all points in this cabinet. An EMCS Block Diagram showing the DTC configuration is included in Division 02.

   c. Designers shall specify that the contractor shall accomplish the required contacts for installation of phone service or the more current ethernet communications network for operable communications upon facility acceptance.

   d. Provide for at least 25% future expansion in cabinets.

   e. Vendor must provide exchange and repair service for all components.

END OF SECTION

DIVISION 15

SECTION 15970 - HVAC CONTROLS

A. Energy Management and Control System (EMCS)

1. General

   a. All installations shall communicate with the central EMCS office and be stand-alone operable for all programmed functions in the case of communications loss with the central computer. Override control of functions shall be possible from the central EMCS computer center. Communications shall therefore include alarm reporting, override control when necessary, and the capability of gathering history summaries on system points.

   b. Provide EMCS control of all systems on the basis of distributed controls using intelligent field interface devices (FID). The existing EMCS systems are an older system by HSQ Technologies, 3A South Linden Avenue, South San Francisco, CA 94080, 1-800-486- 6684, and a newer system based on PC control by Siebe Environmental Controls (Robertshaw), 3915 East Main, Spokane, WA 99202, 509-535-5900 (changing to Invensys, 7222 East Nora, Spokane, WA 99212, 509-892-1121 effective 4 Feb 2000). This Siebe (Robertshaw) system shall be the system for all new EMCS projects (or an approved equivalent).

   c. The EMCS specification shall be based upon a guide specification supplied by the Owner as based on a Corps of Engineers standard quide specification; Section 15931, Direct Digital Control for HVAC. The A/E shall be responsible for specifying control/monitoring points and control sequences for the project.

2. Facility environmental system control shall be accomplished via the EMCS installation programming and hardware. Do not specify a traditional pneumatic control system installation with an additional requirement for EMCS interface. Controls shall be electronic; sequences shall be executed by the EMCS equipment using Direct Digital Control (DDC) style control of pneumatic actuators. Standard actuators shall be pneumatic input from FID controlled pulse-width transducers or analog electrical-pressure transducers. Alternative actuators may be specified based upon economic justification.

3. Specifications shall require that all setpoint and similar control parameters be capable of being changed or altered from the EMCS central computer to facilitate trouble shooting. Do not install setpoint values in permanent memory that require a site visit by maintenance personnel for alteration.

4. The following specifications for EMCS equipment shall be employed for all designs.

   a. The equipment shall be SIEBE/Robertshaw or an approved equivalent that will operate seamlessly with the existing SIEBE/Robertshaw system. The existing Fairchild AFB Energy Management Control System is used to monitor, schedule, alarm (routed to all workstations and via paging system), program, and trouble-shoot over 10,000 input/output points residing in local control systems located in 56 buildings. An existing server-client network supports technicians in the field for this work. On small projects Fairchild personnel have engineered, programmed, installed, and commissioned control systems without contractor involvement. The installed systems shall be compatible with this objective in the future.

   b. Communications over the Fairchild AFB metropolitan area network at 10 MBS shall be required. Both ThinNet (coax) 10Base2 and Twisted-Pair 10Base-T cabling systems shall be supported. Field access to area controllers and application specific controllers using existing laptops shall be required; to include full access to the entire installed programming. Field technicians shall have the ability to communicate with all area controllers located on the same network from one remote location.

   c. The Network Communications Module that provides Ethernet connectivity for the Area Level Controller must be a dedicated device, specifically manufactured for the purpose. Systems using a Personal Computer or a headless PC (PC in a box) together with communications software as this Ethernet Interface shall not be acceptable.

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   f. Integrator Control Programs: The EMCS shall seamlessly support the existing ICP generation capability of the Graphical Engineering Workstation. These existing ICP are custom, user-defined control function programs that simplify routine tasks and provide for base-wide system integration.

   g. Controller Programming: The EMCS shall incorporate built-up and application-specific equipment controllers that program using point-based programming and line-based programming for specialized applications. Fairchild AFB has selected this programming type for its flexibility, power, and ease of use. EMCS equipment that uses object or block programming shall not be acceptable.

h. Support System: Providers of EMCS equipment shall be local to the Fairchild area and shall be a factory branch office, not a dealer simply brokering a manufacturers product. The local factory branch office shall provide engineering, installation, and system spare parts. All installations shall be made by factory trained and certified technicians.

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   a. Outside Air Temperature (OAT) sensors and Relative Humidity (RH) sensors should be installed in a wooden, louvered enclosure and mounted on the north wall of the building, approximately 10 feet above ground level. These sensors are to be sensing actual outside air, not air inside the entrance of a section of ductwork.

   b. A sketch of a typical acceptable wooden enclosure is included in Division 02.

6. Submittals

   a. Coordinate with FAFB 92 Civil Engineer Squadron Contract Development (CECC) Mechanical Engineering section during design process.

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   c. O&M Manual Minimum Content Requirements for EMCS

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      (2) As-built drawings shall show terminal numbers in the EMCS FID and any equipment such as motor starters, air- conditioning compressors, etc.

      (3) Catalog cuts included in the O&M Manual shall be marked with indicating arrows to show the specific installed item.

      (4) Service and calibration information for all installed equipment.

      (5) A detailed contents and format instruction for O&M Manuals is available on request.

7. Installation: Place all equipment in service accessible area such as a locked cabinet in mechanical room. Coordinate placement of cabinets with other crafts requirements.

a. Remotely located equipment must be readily accessible.

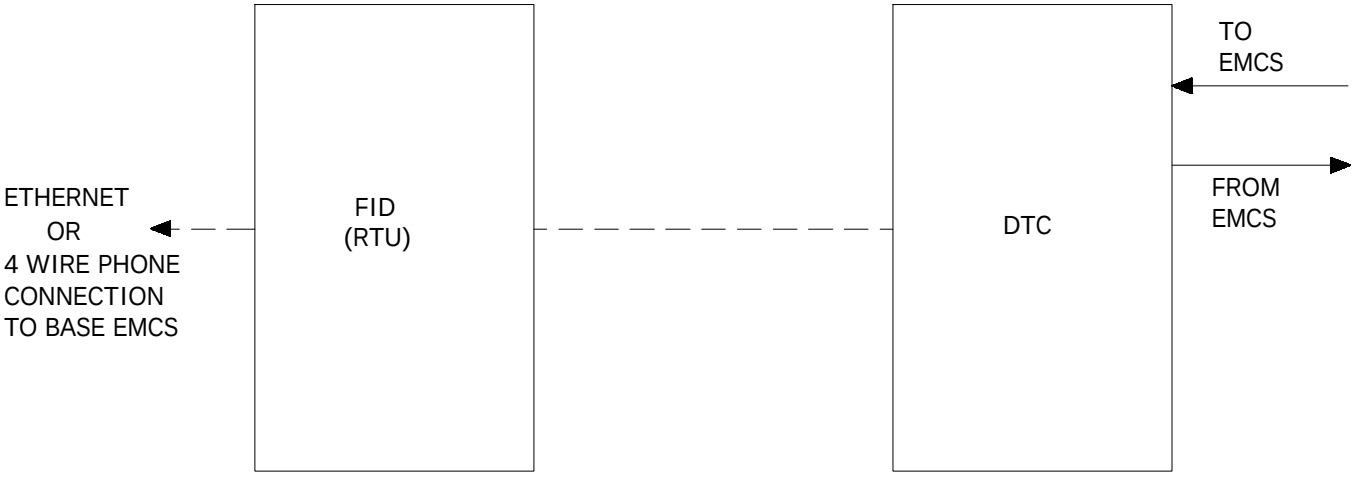
b. Provide Data Termination Cabinet (DTC) with terminal strips for termination of all conductors prior to bringing conductors to FID. Label all points in this cabinet. An EMCS Block Diagram showing the DTC configuration is included in Division 02.

c. Designers shall specify that the contractor shall accomplish the required contacts for installation of phone service or the more current ethernet communications network for operable communications upon facility acceptance.

d. Provide for at least 25% future expansion in cabinets.

e. Vendor must provide exchange and repair service for all components.

END OF SECTION



FIELD INTERFACE DEVICE (FID)

HSQ TECHNOLOGY MODEL 2500 WITH INPUT AND OUTPUT BOARDS RIBBON CABLES, POWER SUPPLIES FURNISH AND MOUNT

— OR —

SIEBE (ROBERT SHAW) FACILITY INTEGRATOR CONFIGURED AS SHOWN ABOVE.

DATA TERMINATION CABINET (DTC)

FURNISH AND INSTALL, PROVIDE TERMINAL BLOCKS FOR FIELD WIRING INTERFACE TO FID WITH CABLED CONNECTIONS MOUNT TRANSDUCERS HERE AND LABEL.

1 EMCS BLOCK DIAGRAM

SCALE: NONE

DIVISION 16

SECTION 16000 - GENERAL INFORMATION

A. GENERAL

1. This information is provided to assist in the design of the project. It is not intended to be a complete specification.

2. Design: The Illuminating Engineering Society Lighting Handbook shall be referenced for lighting design. The design shall be in accordance with the national codes and Air Force regulations. The electrical design shall also be in accordance with the Laws, Rules and Regulations for installing Electric Wires and Equipment mandated by the state of Washington Department of Labor and Industries.

3. Coordinate with Base Electrical Engineering for the best way to connect into the base electrical distribution system. Include connection to the distribution system as part of the project.

B. VOICE AND DATA SYSTEMS

1. Computer circuits: Computers shall have dedicated circuits and full sized dedicated neutrals. Shared neutrals shall not be used. Where appropriate, dedicated panels shall also be provided.

2. Refer to Base Design Standard Section 16740 "Voice and Data Systems" for communication requirements.

C. PANELS AND BREAKERS

1. Panels: Breakers shall be provided whenever possible for overcurrent protection. Breakers for new panels shall be of the bolt-on breaker type. In your specifications specifically state that series rated breakers shall not be used. Provide 25% spare breakers on all new panels. Provide load calculations in the Design Analysis.

2. Panels: All panel faces shall be painted to match adjacent wall color.

D. LIGHTING

1. Exit Lights: Exit lights shall be provided in accordance with Life Safety Code 101. Exit lights shall be state of the art type with LED indicators (no bulb-type).

2. Emergency Lighting: Emergency lighting shall be provided in accordance with LSC 101 and ETL 91-5. Down lighting built into EXIT lights is acceptable if it meets thefootcandle illumination requirements as a means of egress. Generally provide egress lighting by ceiling fluorescent fixtures with emergency ballasts. Wall mounted battery/lamp type units shall be installed only with special permission from the base Architect.

3. Parking and Recreational Lighting: This type of lighting is provided by fixtures mounted at an average height of between 30 and 50 feet and is used in recreational areas and parking areas. Provide rectangular (shoe box) luminaires equal to Holophane Parklane Flat Door Kim Cat. #5SQ or approved equal. Fixtures shall be high-pressure sodium or metal halide lamps (depending upon the function of the area) of a wattage to provide the footcandle levels recommended by the Illuminating Engineering Society (IES) of North America and in accordance with industry standard practice. Provide square, tapered pole (or round, tapered pole, based on matching existing poles in the vicinity) with anodized dark bronze finish. Provide unpainted concrete bases set with the top 30 inches above grade.

4. Roadway Lighting: This type of lighting is provided by fixtures mounted at average heights of between 30 and 50 feet and of the type typically used in roadway applications. Provide standard highway luminaire equal to Holophane Vector or approved equal. Provide high pressure sodium lamps of a wattage to provide the footcandles recommended by the Illuminating Engineering Society (IES) of North America and in accordance with industry standard practice. A good guide is to provide a wattage similar to the other street lights in the immediate area. Generally housing areas are 100 watts. Provide round tapered brushed aluminum break-away poles. Unpainted concrete bases shall be set with the top 3 inches above grade.

E. MOTORS AND CONTROLERS

1. Motors: Motors shall be high efficiency types and use de-rated values for supply voltages, i.e. for a 480 volt service, provide a 460 volt motor. For a 208 volt service, provide a 200 volt motor. In addition, all motors shall have a disconnect switch as required by the NEC. Motors over 10 HP shall have under-voltage, phase loss, and phase reversal protection.

2. Variable Speed Drives: When provided, variable frequency drive (VFD) controllers shall be enclosed in a ventilated enclosure with separate conduit for input and output power. Specify ABB (Asea Brown Boveri) brand VFD' s.

F. METERS

1. Electrical meters shall be provided for all new facilities and all major remodels. Meters shall measure kilowatt-hours and demand. The meter multiplier shall be clearly marked on the inside of the meter. Calculations showing how the multiplier was obtained shall be submitted by the Contractor to the Contracting Officer for approval.

G. GENERATORS

1. Generator Automatic Transfer Switches: Provide a bypass switch to allow all power to be disconnected from the transfer switch while maintaining power to the facility. This will

allow maintenance of the switch without causing an outage. Existing auto-transfer switches are Lakeshore, Westinghouse and Onan.

2. Emergency Generator Rooms: Provide generator rooms with automatic louvers and exhaust fans for ventilation. Provide overhead and side lighting to minimize shadows. Provide water outlet, bay or double doors to allow replacement of generator, minimum 30 inches (800 mm) working clearance all sides. Provide sound dampers. Auto-transfer switches and start panels shall be located in the generator room.

H. OUTLETS

1. Mechanical and Electrical Room Outlets: Electrical and mechanical rooms shall be provided with convenience outlets every 12 feet (3,600 mm). One RJ-45 telephone jack shall be provided in each electrical and mechanical room.

I. COLOR CODING

1. Color coding for all three phase circuits shall be in accordance with the following:

	480V		208V
Phase A		Brown	Black
Phase B		Orange	Red
Phase C		Yellow	Blue
Neutral	White		White
Ground	Green		Green

J. CONDUCTORS

1. All conductors shall be copper.

K. QUALIFICATIONS OF WORKERS

1. The contract shall require all electricians orhigh voltage linemen to be licensed by a state for the trade in which they are working. All Federal and Washington State labor laws shall be followed.

END OF SECTION

DIVISION 16

SECTION 16460 - 15 KV ELECTRICAL DISTRIBUTION SYSTEMS

A. GENERAL

1. The following information provides guidance to Design Engineers and is to be incorporated into their specifications. This information is not a complete specification.

2. The base electrical distribution system is rated 13.2 KV phase to phase and 7620 volts phase to neutral. The system is 4 wire, 60 Hertz, 3 phase, grounded wye. The area north of the runway is fed by an underground distribution system. The area south of the runway is fed by a combination underground/overhead system. Housing areas are fed by a combination underground/overhead system.

3. The existing distribution system is a loop system. All additions to the underground distribution system shall be designed as loop systems unless specifically authorized to do otherwise by 92 CES/CECC. Provide fused switches whenever conductors are being powered from the distribution system main trunk lines.

B. UNDERGROUND DISTRIBUTION SYSTEM

1. 15KV Cable shall be copper conductors, 15 KV, URD construction, 133% EPR insulation, 1/3 concentric neutral for 3 phase circuits, full concentric neutral for single phase circuits, full PVC or polyurethane jacket over the concentric neutral, 2/0 conductor for main trunk line feeders, #2AWG conductor for loop feeders.

2. Corona shields shall not be used as neutrals. All extensions of the base distribution system shall be color coded to identify the phasing of the conductors. Color notation for phases is left to right, Brown-Orange-Yellow for 13.2 KV. Ground all neutrals, lock all cabinets with Exterior Shop locks, label all lines, where they originate and terminate.

3. 15 KV underground cable shall be installed in concrete encased ductbanks. Provide 4 inch PVC or EB conduit. Provide spare conduit with pull wire for future use. Place ductbank 36 inches (900 mm) below grade. Provide rigid galvanized steel elbows at all transformers, junction cabinets, short bends. Encase elbows in concrete. Secure conduit in position before placing concrete. Provide plastic warning tape with metallic wire above all duct runs.

4. All outdoor equipment shall be painted according to the standard colors identified in the BDS Architectural/Structural section.

5. 15 KV splices and terminations shall be rated for the full ampacity of the cables being connected. All 15KV cable shall be hipot tested before energization. "T" type splices shall not be used. Dead break or Load break elbows shall not be installed in manholes.

6. Transformers for the underground distribution system shall be oil filled, pad mounted, dead front, loop feed (plug unused bushings). Three phase transformer primary windings shall be rated 13.2 KV phase to phase, Delta connected primary (3 phase), grounded wye secondary. Single phase transformers shall be rated 7620 volts phase to neutral primary, grounded secondary. All transformers shall be provided with 95 BIL, gang operated load break switch, primary bayonet fusing, taps + 2-2 1/2 %, de-energized tap changer switch, high voltage parking stand, penta-head locking bolt, 200 amp load break integral bushings, pressure relief valves, separate primary and secondary compartments. Provide minimum 8' clearance on operable sides for "hot stick" work and 4' clearance on all other sides when installing block/brick walls around pad mounted transformers.

7. 15 KV Junction Cabinet (Sectionalizing Terminals) shall be 12-gauge steel, with stainless steel hardware, one-piece construction, top-hinged, removable door, recessed lock pocket with padlock hasp and penta-head silicon bronze door bolt, door stop, hinge retainer, hold down cleats, one parking stand per phase, ground clamp nuts welded in place (one per phase). Junction points shall be rated 15 KV, 600 amps for 2/0 cable, 200 amps (load break) for #2AWG cable. Equipment shall be padmounted type. Provide minimum 8' clearance on operable sides for "hot stick" work and 4' clearance on all other sides when installing block/brick walls around pad mounted junction cabinets.

8. Oil switches shall not be used.

9. All 15 KV switches shall be provided with type SMU-20 fuses. Key interlocks are not allowed. S&C manufacture most base switches. Other brands are allowed but must accept the SMU-20 fuses.

10. All pad-mounted equipment (transformers, switches and junction enclosures) shall be mounted on a reinforced concrete pad (or approved equal). A grounding ring of 4/0 bare copper shall encircle the pad and be buried 24 inches below grade. Provide four ground rods (one at each corner of the pad). Provide a 4/0 copper cable from the ground ring to inside the equipment enclosure for grounding in accordance with the National Electrical Safety Code and the National Electrical Code. All connections between the ground rods and the 4/0 cable shall be exothermic type equal to Cadweld brand.

C. OVERHEAD DISTRIBUTION SYSTEM

1. Primary lines shall be copper hard/semi-hard drawn cable. Strain insulators shall not be used. Stirrups shall be placed at all distribution taps. CSP transformers shall not be used. External taps for transformers shall have two primary bushings. Provide lightning arrestors and fused disconnects on all aerial-underground transitions.

2. Secondary lines and service drops shall be copper, duplex, triplex, or quadraplex. Weatherheads shall be used. Dead end with wedge clamps and insulators. Use compression connectors for secondary distribution, split-bolts shall not be used.

3. Service laterals shall be copper and installed in conduit. Conduit shall be PVC (preferred) or rigid galvanized steel wrapped in corrosion inhibiting tape.

END OF SECTION

DIVISION 16

SECTION 16660 - CORROSION CONTROL

A. General Information

1. Cathodic protection shall be provided for all underground metallic tanks, metallic structures in contact with the earth, and underground metallic piping associated with the following systems:

    a. Petroleums, Oils, and Lubricants (POL) systems
    b. Water tanks (interior and exterior surfaces)
    c. Fuel storage systems
    d. Natural Gas piping
    e. Steam piping

2. NACE Certification: All cathodic protection designs provided by the A-E shall be designed by a National Association of Corrosion Engineers International (NACE International) certified Corrosion Specialist or NACE certified Cathodic Protection Specialist. Design calculations shall be submitted for approval to the Contracting Officer. All cathodic protection designs shall be coordinated with the Base Cathodic Protection Engineer or Technician. The preferred method of protection is impressed current; however, sacrificial anodes may be used as design conditions dictate. All cathodic protection designs should consider the effect of interference upon existing cathodic protection systems and the structures they protect. A NACE International certified Corrosion Specialist shall supervise the installation and adjustments of all cathodic protection systems.

3. Soil Resistivity: Soil resistivity varies widely across the base. All cathodic protection design calculations shall be based upon actual soil resistivity measurements taken at the project site. Soil resistivity tests shall be taken by a certified NACE International Corrosion Specialist.

4. The following sentences describe how the existing utility systems are protected.

    a. Underground steel piping associated with POL, fuels, natural gas, and steam lines are protected by coatings and cathodic protection.

    b. All water tanks are protected by coatings and cathodic protection.

    c. Petroleums, Oils, and Lubricants (POL) system is protected by coatings, sacrificial anodes, and five overlapping impressed current systems. No additions to this system will be allowed without an additional impressed current system.

d. Natural gas lines are protected by coatings and three overlapping impressed current systems.

e. Steam lines are protected by sacrificial anodes. Chemical treatment of the steam retards the internal corrosion of the pipes. The base has experienced repeated failures of insulating flanges used on steam lines. The insulating materials used are not able to stand up to the temperatures and pressures of the steam. They typically fail within the first year and get replaced with standard bolts and gaskets. Based upon our experience, do not specify insulating flanges on steam lines for cathodic protection purposes. The base will accept the lower levels of cathodic protection on the steam line caused by not using the flanges.

f. Sewer systems shall require no corrosion control.

g. Fire protection systems receive water from base mains with no special measures to control corrosion unless underground steel piping is used. If steel piping is used, sacrificial anodes are installed. If the main and service are of dissimilar materials then an insulated coupling shall be installed between them.

END OF SECTION

DIVISION 16

SECTION 16740 - VOICE AND DATA SYSTEMS

A COMPUTER SYSTEM DESCRIPTION OF WORK

1. Computers shall have dedicated circuits and full sized dedicated neutrals. Shared neutrals shall not be used. Where appropriate, dedicated panels shall also be provided

2. Provide a complete cable system, IAW SP-2840 Commercial telecommunications Cabling Standard ANSI/EIA/TIA. This includes each wall outlet to the computer network patch panel mounted in each Telecommunications Outlet Closet (WTOC) or a 19" equipment rack in the Main Cross-connect (MC). An additional one foot of cable shall be left on or near the network patch panel for future cable re-termination. An additional 4" to 8" of each cable shall be left at or near each outlet box/jack for future cable retermination. No microbends shall be permitted less than 2" bend radius for the entire cable run. Cable runs must be continuous full length - no splices are allowed between contacts on patch panel and work station jacks.

3. Provide a 19" rack with cable management in the MC room, provide plywood backboard in locations indicated for computer network equipment. The dimensions of the MC must be not less than 10' X 10", and ventilated to handle 4,000 BTU/HR at 59-90 degrees F with 20-80% humidity, non-condensing.

4. Provide all computer outlet boxes, pull boxes, plates and jacks.

5. Provide Work-area Telecommunications Outlet Closet (WTOC) when the distance from the main cross connect exceeds 292' (90 meters). This closet must be ventilated to handle 2,000 BTU/HR at 59-90 degrees F with 20-80% humidity, non-condensing.

6. Link the main cross connect to the WTOC via six strand fiber. Terminate all six of the fibers on a rack mounted patch panel in the main cross connect room. Terminate all six of the fibers in a wall mounted distribution center in the WTOC.

7. Provide 110/120 VAC 30 Amp quad-plex power to the main cross connect equipment rack. Provide a duplex 110/120 VAC 20 Amp outlet on the network backboards in the WTOC. Both of these circuits must be dedicated power and marked on the main power distribution panel.

B TELEPHONE SYSTEM DESCRIPTION OF WORK

1. Provide all telephone wiring in ¾" conduit. Locate each station jack 12" from every 110 VAC electrical outlet. In areas exceeding 1,000 SF on contiguous net space, a duplex outlet shall be provided for approximately every 48 SF.

2. Wiring for all telephones shall be individually shielded twisted pair. Telephone wiring shall be based on the single-line concept. Provide all station wiring for voice using home run technique from the station end to the Intermediate Distribution Frame (IDF) or Building Entrance Terminal (BET). The telephone station wiring shall not be terminated at either end, but left with enough slack to allow proper termination. Circuit connectivity will be performed by the 92d Communications Squadron (92 CS).

3. Label each individual station wire at both ends with room number and jack designation number.

4. Outlets for single-line telephones shall be modular duplex type. Each outlet jack shall be numbered and wired with two 4 pair (8 conductor), category 5.

5. Bundle all station wiring supporting telephones separately from other cables (e.g. LAN cables).

6. Communications Cross-connect Closets. Provide cross-connect closets to serve approximately every 10,000 SF of usable floor space. They shall serve as an interconnection point between the service outlets and the main communications frame in the Communications equipment room. Wall and floor space shall be provided for installation and maintenance of communication equipment such as frames/backboards, line amplifiers for LANs, and concentrators. Such equipment shall not be installed in common use areas. A minimum of 100 pair house cable will be required to be run from the BET depending on the number of jacks serviced from the closets. (e.g. 100 jacks = 200 pairs house cable, 50 jacks = 100 pairs house cable.)

7. An indoor protected building entrance terminal shall be provided by the contractor for new buildings. The 92 CS will connect the terminal to the contractor provided cable.

8. Communications Equipment Room (CER). A CER shall be provided as necessary for communications system switching and transmission equipment (PBXs, gateways, power supplies, etc.), main distribution frame, and other equipment needed for termination of the building's interior wiring systems and to interface them with the exterior (outside plant) cable system. Adequate installation and maintenance space, environmental control and power shall be included to support this equipment and any necessary cable entry requirements.

9. Provide intra-building communications wiring and duct for fire alarm and energy management and control systems (EMCS) from the building's main communications distribution frame to the alarm system control panel/transmitter or the EMCS Data Termination Cabinet/Field Interface Device.

10. Provide exterior duct system to support all valid communication requirements from the facility's communications equipment room to the base dial central office or nearest service connection point. Include entrance ducts (including spares), duct and manhole systems in the immediate vicinity of the facility and necessary provisions for crossing roads and other paved areas. The contractor shall provide trenching, conduit, and cable to the nearest manhole identified by 92CS. The contractor shall be responsible for backfilling and resurfacing grounds to their original condition. Sufficient slack cable shall be left at each end of cable run to provide for proper termination. All terminations will be performed by 92CS.

C. MATERIALS

1. Raceways, boxes, etc., shall be as specified instructions 16110 and 16134.

2. LAN computer backboard shall be 3/4" plywood (AD grade), painted with two coats of fire resistive gray paint.

3. Provide a surface mounted 1" W x 24" L mounted copper ground bar or equivalent for the equipment rack or backboard with a #2 copper ground wire to building grounding system.

4. Computer stub-ups conduits shall be minimum 3/4" dia.

5. Each computer outlet shall be Category 5, 10 base T wiring configuration to the 568B standard and shall consist of the following:

   a. Telephone/Data Outlets: Outlets for use as voice and data shall consist of the following:

Four inch square, 2-1/2" deep box	
One gang mud ring	
One AT&T M14A-246	Modular 4-port ivory faceplate
Two AT&T M100BH-318	Modular jack, 8P/8C, T568B, blue
Two AT&T M60D-318	Icon, 'Data', blue
Two AT&T M100BH-246	Modular jack 8P/8C, T568B, ivory
Two AT&T M60E-246	Icon, 'Voice', ivory

   b. Data Outlets: Separate 2 port data shall consist of the following:

Four inch square, 2-1/2" deep box	
One gang mud ring	
One AT&T M14A-246	Modular 4-port ivory faceplate
Two AT&T M100BH-318	Modular jack, 8P/8C, T568B, blue
Two AT&T M60D-318	Icon, 'Data', blue
Two AT&T M20A-246	Modular blanks, ivory

6. Fiber Optic cable shall consist of both multi-mode fibers and single-mode fibers within the same cable sheath. This is also known as composite fiber cable. The multi-mode fiber shall be 62.5/125 micron fiber with a bandwidth of not less than 200/500 MHx-Km at 850/1330

nanometers. The attenuation shall be no greater than 3.5/1.0 dB/Km at 850/1330 nanometers. No splices are allowed for distances of less than 2 kilometers. The attenuation of connectors shall be no greater than 0.5/0.25 dB at both 850/1300 nanometers.

7. Provide four-pair Unshielded Twisted Pair (UTP) 24 AWG LAN Cable Berk-Tek Category 5 Non-Plenum Rated part no. 28-H-MCR24-4D (blue) or plenum part no. 28-H-MCP24-4D (155 Mbps ATM compatible) from each computer jack (RJ 45, TSGBB config) to the LAN patch panel. Identify each end of each cable with room number and cable number where each outlet is located. Obtain list of permanent room numbers from Contracting Officer and use them along with a letter designation (optional), followed by a second number identifying the jack/cable/patch panel (e.g. 113-3, indicating room 113, jack/cable/patch panel number 3). Do not use construction drawing room numbers. Unless instructed, these will be the owner's room numbers. Use Sharpie or other permanent ink marker during installation at each end of cables. LAN cable shall have a jacket color distinct from the telephone cable (i.e. LAN-Blue, Telephone-White).

8. When cable termination is made, label within 6" of jacket end using Panduit LS4H Heat Shrink Marking System or other approved heat shrink label products on both ends of each cable. Label jack faceplates using Brother P-Touch or Panduit LS4M or Panduit LSS Marking Systems for each modular jack port, and with same equipment label completely all patch panels with circuit identification numbers. Modular jacks at both patch panels and work station shall be labeled with circuit identification numbers with Sharpie as described above. Patch panel circuit arrangements (order of cable/circuit termination) shall be documented in writing along with Record Drawings for all work station jack locations.

9. Terminate all computer cables on Type 110/RJ45 patch panels on the computer LAN network rack or backboard in the MC or WTOC.

10. Patch panels shall consist of any number of multiples of the following, dependent on the number of cables terminated at each panel location. Color stripes on the cable will correspond to the color designation on the edge connector.

AT&T #1100CAT5-24	24 port panel kit, 569B
AT&T #1100CAT5-48	48 port panel kit, 568B
AT&T #1000CAT5-96	96 port panel kit, 568B
AT&T #600A2-12ST	12 Port Fiber Patch Panel, ST
AT&T #600A2-24ST	24 Port Fiber Patch Panel, ST

11. Provide panels and racks complete with wire managers, hinged rack, stand off brackets, for a complete installation.

PFT #CMS-1977A	7' x 19" Cable Management Rack, aluminum, black
AT&T #110D1-35-19	Cable Management panel, horz. & vert., black
AT&T #	3.5" wall mount bracket for RJ45 patch panel
AT&T #	7" wall mount bracket for RJ45 patch panel
Siecor #WIC-012	Wall mounted interconnect center, fiber termination

Siecor #WIC-Guard	WIC connector guard
Siecor #WIC-Blank	WIC Blank panel
Siecor #WIC-012	WIC 6 port ST connector panel

D. INSTALLATION

1. All cables shall be run through walls in conduit stub-ups, in tunnel areas, in cable trays, or in ceiling areas suspended above ceiling tile grid by the use of plenum-rated cable ties and/or caddie clips for connection to drop ceiling suspension wire. Cable shall not rest on ceiling tile grid.

2. LAN and telephone cables above ceilings shall be supported on bridle rings on 3 foot centers. Bridle rings shall consist of 3/8" threaded rods attached to the structure above and provided with a BEE-LINE #B369OF-2 hanger or approved equal. The hanger shall be rated for 50 pounds capacity. The cables shall be neatly bundled and tied with tie wraps into groups of 60 or less with one bundled group per hanger.

3. Bond all systems stub-ups and raceways per Section 16450.

4. Sleeves are to be provided in fire walls above ceilings to provide paths wherever cables are being routed. At fire walls provide 211 rigid steel conduit (RSC) threaded nipples with bushings (both sides). Provide two 211 RSC for systems cables. Provide fire seal as specified in Section 16110 wherever passage through any type of fire wall is required.

5. All fiber cables shall be run in interduct, with an individual interduct for every fiber cable. Secure the interduct along the route with cable ties or U-shaped mounting brackets. Rubber grommets shall be used wherever the fiber enters and exits the interduct.

6. Fiber shall be single-mode 8.3/125 um and multimode 62.5/125 um, plenum or non-plenum as required.

7. Fiber shall be terminated with ST style connectors on each end. If pigtails are used in lieu of individually terminating each fiber, fusion splicing must be used. the splice must be contained in a splice tray.

8. Twisted pair wire and fiber will be supported via ladder rack from the wall to the LAN equipment rack in the main cross-connect room.

9. Complete testing of each four-pair LAN cable run is required. Testing shall be conducted by using the Microtest PentaScanner at the patch panel end of the cable and the Microtest Super Injector at the modular jack end of the cable. Standards used shall be ATM 155 Mbps. Tests to be conducted shall be (but shall not be limited to):

    a. Wire Map: Must be 12345678 straight through on near and far ends with no intermittent disruptions with wiring to code for EIA/TIA configuration T568B at both patch panel and modular jack ends of each cable.

b. Length: Must be in feet between 10 and 292 for each wire pair (i.e., four tests for a four-pair cable).

c. Impedance: Must be in ohms between 80 and 125 measured independently for each wire pair (see above).

d. Resistance: Must be in ohms between 0 and 18.8 for each wire pair.

e. Capacitance: Must be in pF picofarads between 50 and 5600 for each wire pair.

f. Attenuation: Must be in dB Decibels at a measured frequency in MHz listed at a limit in dB as follows:

2.4 dB at 1 Mhz	10.0 dB at 20 Mhz
4.7 dB at 4 Mhz	11.3 dB at 25 Mhz
6.3 dB at 8 Mhz	12.6 dB at 31.25 Mhz
7.0 dB at 10 Mhz	18.3 dB at 62.5 Mhz
9.0 dB at 16 Mhz	23.6 dB at 100 Mhz

g. Measurement of attenuation at 62.5 Mhz with a limit of 18.3 dB shall be used for printed report purposes.

h. Near-End Crosstalk (NEXT): Must be measured for each possible two pair combination, worst case measured in dB at the frequency which it occurred between 0.7 and 100 MHz (measured in linear 200 KHz steps), and each two pair combination must not exceed the NEXT limit as follows:

Pairs 12/36 > 28.1 dB	Pairs 12/45 > 27.1 dB
Pairs 12/78 > 27.8 dB	Pairs 36/45 > 27.1 dB
Pairs 36/78 > 27.1 dB	Pairs 45/78 > 27.6 dB

i. Attenuation to Crosstalk Ratio (ACR): Must be measured for each possible two pair combination (six combinations equals six tests) and must not be less than 5.0 dB on any pair combination.

10. Fibers tested and certified at 850 nm and 1300 nm wavelengths. Acceptable loss must be no more than .5 dB per connector and .1 dB per 100' at both wavelengths.

11. Testing completed from paragraph D.1.i. above must be completely documented with circuit identification number, all pass and fail reports (circuits with failures must be made to pass before they are acceptable and hence should have a minimum of two test reports), date of testing, cable manufacturer, tester serial number, software version (must be version 1.10a or other newer version superseding 1.10a), building, floor, closet, and all results from eight categories of testing. Each test shall be listed on a separate letter-sized sheet of white bond paper and shall also be available on 3-1/2" diskette in DOS format. A cover letter signed by

LAN installer/tester certifying complete compliance with Category Five or ATM/155 mbps standards as specified by the latest EIA/TIA specifications with a 3-1/2" diskette Microsoft Excel (Version 5.0 or newer) listing each test result is acceptable in lieu of letter size sheet of white paper. Diskette(s) shall be able to be read and processed by readily available Microsoft Word (version 6.0 or newer) work processors or Microsoft Excel (Version 5.0 or newer). All written copies must be signed by LAN installer/tester certifying complete compliance with Category Five or ATM/155 mbps standards as specified by the latest EIA/TIA specifications.

12. All cables must be terminated using a compression connection tool. All cables shall be installed using Category Five standards as follows: Wire pair twists must be maintained to within 1/2" of contacts on each jack, jacketing must be undamaged for the full length of the cable run and must continue to within two inches of IDC contacts on each jack. All plastic cable ties must be trimmed with a flush-cut tool to ensure that no sharp edges result. Any cable(s) damaged during pulling shall be the responsibility of the pulling party/parties. Any cables failing tests (see above) shall be re-terminated, re-routed, re-tested, etc., until no other alternatives exist, at which time it will be assumed that a bad cable run (too much twisting of the cable, compression of jacketing and wire pairs, etc.) has resulted (at the discretion of the LAN Tester) and the pulling party/parties shall have to bear the responsibility of repulling new cable to replace it.

END OF SECTION

SECTION 16740 - VOICE AND DATA SYSTEMS

PART 1 - GENERAL

1.01 COMPUTER SYSTEM DESCRIPTION OF WORK

A. Computers shall have dedicated circuits and full sized dedicated neutrals. Shared neutrals shall not be used. Where appropriate, dedicated panels shall also be provided

B. Provide a complete cable system, IAW SP-2840 Commercial telecommunications Cabling Standard ANSI/EIA/TIA. This includes each wall outlet to the computer network patch panel mounted in each Telecommunications Outlet Closet (WTOC) or a 19" equipment rack in the Main Cross-connect (MC). An additional one foot of cable shall be left on or near the network patch panel for future cable re-termination. An additional 4" to 8" of each cable shall be left at or near each outlet box/jack for future cable retermination. No microbends shall be permitted less than 2" bend radius for the entire cable run. Cable runs must be continuous full length - no splices are allowed between contacts on patch panel and work station jacks.

C. Provide a 19" rack with cable management in the MC room, provide plywood backboard in locations indicated for computer network equipment. The dimensions of the MC must be not less than 10' X 10", and ventilated to handle 4,000 BTU/HR at 59-90 degrees F with 20-80% humidity, non-condensing.

D. Provide all computer outlet boxes, pull boxes, plates and jacks.

E. Provide Work-area Telecommunications Outlet Closet (WTOC) when the distance from the main cross connect exceeds 292' (90 meters). This closet must be ventilated to handle 2,000 BTU/HR at 59-90 degrees F with 20-80% humidity, non-condensing.

F. Link the main cross connect to the WTOC via six strand fiber. Terminate all six of the fibers on a rack mounted patch panel in the main cross connect room. Terminate all six of the fibers in a wall mounted distribution center in the WTOC.

G. Provide 110/120 VAC 30 Amp quad-plex power to the main cross connect equipment rack. Provide a duplex 110/120 VAC 20 Amp outlet on the network backboards in the WTOC. Both of these circuits must be dedicated power and marked on the main power distribution panel.

1.02 TELEPHONE SYSTEM DESCRIPTION OF WORK

A. Provide all telephone wiring in ¾" conduit. Locate each station jack 12" from every 110 VAC electrical outlet. In areas exceeding 1,000 SF on contiguous net space, a duplex outlet shall be provided for approximately every 48 SF.

B. Wiring for all telephones shall be individually shielded twisted pair. Telephone wiring shall be based on the single-line concept. Provide all station wiring for voice using home run technique from the station end to the Intermediate Distribution Frame (IDF) or Building Entrance Terminal (BET). The telephone station wiring shall not be terminated at either end, but left with enough slack to allow proper termination. Circuit connectivity will be performed by the 92d Communications Squadron (92 CS).

C. Label each individual station wire at both ends with room number and jack designation number.

D. Outlets for single-line telephones shall be modular duplex type. Each outlet jack shall be numbered and wired with two 4 pair (8 conductor), category 5.

E. Bundle all station wiring supporting telephones separately from other cables (e.g. LAN cables).

F. Communications Cross-connect Closets. Provide cross-connect closets to serve approximately every 10,000 SF of usable floor space. They shall serve as an interconnection point between the service outlets and the main communications frame in the Communications equipment room. Wall and floor space shall be provided for installation and maintenance of communication equipment such as frames/backboards, line amplifiers for LANs, and concentrators. Such equipment shall not be installed in common use areas. A minimum of 100 pair house cable will be required to be run from the BET depending on the number of jacks serviced from the closets. (e.g. 100 jacks = 200 pairs house cable, 50 jacks = 100 pairs house cable.)

G. An indoor protected building entrance terminal shall be provided by the contractor for new buildings. The 92 CS will connect the terminal to the contractor provided cable.

H. Communications Equipment Room (CER). A CER shall be provided as necessary for communications system switching and transmission equipment (PBXs, gateways, power supplies, etc.), main distribution frame, and other equipment needed for termination of the building's interior wiring systems and to interface them with the exterior (outside plant) cable system. Adequate installation and maintenance space, environmental control and power shall be included to support this equipment and any necessary cable entry requirements.

I. Provide intra-building communications wiring and duct for fire alarm and energy management and control systems (EMCS) from the building's main communications distribution frame to the alarm system control panel/transmitter or the EMCS Data Termination Cabinet/Field Interface Device.

J. Provide exterior duct system to support all valid communication requirements from the facility's communications equipment room to the base dial central office or nearest service connection point. Include entrance ducts (including spares), duct and manhole systems in the immediate vicinity of the facility and necessary provisions for crossing roads and other paved areas. The contractor shall provide trenching, conduit, and cable to the nearest manhole identified by 92 CS. The contractor shall be responsible for backfilling and resurfacing grounds to their original condition. Sufficient slack cable shall be left at each end of cable run to provide for proper termination. All terminations will be performed by 92 CS.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Raceways, boxes, etc., shall be as specified instructions 16110 and 16134.

B. LAN computer backboard shall be 3/4" plywood (AD grade), painted with two coats of fire resistive gray paint.

C. Provide a surface mounted 1" W x 24" L mounted copper ground bar or equivalent for the equipment rack or backboard with a #2 copper ground wire to building grounding system.

D. Computer stub-ups conduits shall be minimum 3/4" dia.

E. Each computer outlet shall be Category 5, 10 base T wiring configuration to the 568B standard and shall consist of the following:

1. Telephone/Data Outlets: Outlets for use as voice and data shall consist of the following:

Four inch square, 2-1/2" deep box	
One gang mud ring	
One AT&T M14A-246	Modular 4-port ivory faceplate
Two AT&T M100BH-318	Modular jack, 8P/8C, T568B, blue
Two AT&T M60D-318	Icon, 'Data', blue
Two AT&T M100BH-246	Modular jack 8P/8C, T568B, ivory
Two AT&T M60E-246	Icon, 'Voice', ivory

2. Data Outlets: Separate 2 port data shall consist of the following:

Four inch square, 2-1/2" deep box	
One gang mud ring	
One AT&T M14A-246	Modular 4-port ivory faceplate
Two AT&T M100BH-318	Modular jack, 8P/8C, T568B, blue
Two AT&T M60D-318	Icon, 'Data', blue

Two AT&T M20A-246	Modular blanks, ivory

F. Fiber Optic cable shall consist of both multi-mode fibers and single-mode fibers within the same cable sheath. This is also known as composite fiber cable. The multi-mode fiber shall be 62.5/125 micron fiber with a bandwidth of not less than 200/500 MHx-Km at 850/1330 nanometers. The attenuation shall be no greater than 3.5/1.0 dB/Km at 850/1330 nanometers. No splices are allowed for distances of less than 2 kilometers. The attenuation of connectors shall be no greater than 0.5/0.25 dB at both 850/1300 nanometers.

G. Provide four-pair Unshielded Twisted Pair (UTP) 24 AWG LAN Cable Berk-Tek Category 5 Non-Plenum Rated part no. 28-H-MCR24-4D (blue) or plenum part no. 28-H-MCP24-4D (155 Mbps ATM compatible) from each computer jack (RJ 45, TSGBB config) to the LAN patch panel. Identify each end of each cable with room number and cable number where each outlet is located. Obtain list of permanent room numbers from Contracting Officer and use them along with a letter designation (optional), followed by a second number identifying the jack/cable/patch panel (e.g. 113-3, indicating room 113, jack/cable/patch panel number 3). Do not use construction drawing room numbers. Unless instructed, these will be the owner's room numbers. Use Sharpie or other permanent ink marker during installation at each end of cables. LAN cable shall have a jacket color distinct from the telephone cable (i.e. LAN-Blue, Telephone-White).

H. When cable termination is made, label within 6" of jacket end using Panduit LS4H Heat Shrink Marking System or other approved heat shrink label products on both ends of each cable. Label jack faceplates using Brother P-Touch or Panduit LS4M or Panduit LSS Marking Systems for each modular jack port, and with same equipment label completely all patch panels with circuit identification numbers. Modular jacks at both patch panels and work station shall be labeled with circuit identification numbers with Sharpie as described above. Patch panel circuit arrangements (order of cable/circuit termination) shall be documented in writing along with Record Drawings for all work station jack locations.

I. Terminate all computer cables on Type 110/RJ45 patch panels on the computer LAN network rack or backboard in the MC or WTOC.

J. Patch panels shall consist of any number of multiples of the following, dependent on the number of cables terminated at each panel location. Color stripes on the cable will correspond to the color designation on the edge connector.

AT&T #1100CAT5-24	24 port panel kit, 569B
AT&T #1100CAT5-48	48 port panel kit, 568B
AT&T #1000CAT5-96	96 port panel kit, 568B
AT&T #600A2-12ST	12 Port Fiber Patch Panel, ST
AT&T #600A2-24ST	24 Port Fiber Patch Panel, ST

K. Provide panels and racks complete with wire managers, hinged rack, stand off brackets, for a complete installation.

PFT #CMS-1977A	7’ x 19” Cable Management Rack, aluminum, black
AT&T #110D1-35-19	Cable Management panel, horz. & vert., black
AT&T #	3.5” wall mount bracket for RJ45 patch panel
AT&T #	7” wall mount bracket for RJ45 patch panel
Siecor #WIC-012	Wall mounted interconnect center, fiber termination
Siecor #WIC-Guard	WIC connector guard
Siecor #WIC-Blank	WIC Blank panel
Siecor #WIC-012	WIC 6 port ST connector panel

PART 3 - EXECUTION

3.01 INSTALLATION

A. All cables shall be run through walls in conduit stub-ups, in tunnel areas, in cable trays, or in ceiling areas suspended above ceiling tile grid by the use of plenum-rated cable ties and/or caddie clips for connection to drop ceiling suspension wire. Cable shall not rest on ceiling tile grid.

B. LAN and telephone cables above ceilings shall be supported on bridle rings on 3 foot centers. Bridle rings shall consist of 3/8” threaded rods attached to the structure above and provided with a BEE-LINE #B369OF-2 hanger or approved equal. The hanger shall be rated for 50 pounds capacity. The cables shall be neatly bundled and tied with tie wraps into groups of 60 or less with one bundled group per hanger.

C. Bond all systems stub-ups and raceways per Section 16450.

D. Sleeves are to be provided in fire walls above ceilings to provide paths wherever cables are being routed. At fire walls provide 211 rigid steel conduit (RSC) threaded nipples with bushings (both sides). Provide two 211 RSC for systems cables. Provide fire seal as specified in Section 16110 wherever passage through any type of fire wall is required.

E. All fiber cables shall be run in interduct, with an individual interduct for every fiber cable. Secure the interduct along the route with cable ties or U-shaped mounting brackets. Rubber grommets shall be used wherever the fiber enters and exits the interduct.

F. Fiber shall be single-mode 8.3/125 um and multimode 62.5/125 um, plenum or non-plenum as required.

G. Fiber shall be terminated with ST style connectors on each end. If pigtails are used in lieu of individually terminating each fiber, fusion splicing must be used. the splice must be contained in a splice tray.

H. Twisted pair wire and fiber will be supported via ladder rack from the wall to the LAN equipment rack in the main cross-connect room.

I. Complete testing of each four-pair LAN cable run is required. Testing shall be conducted by using the Microtest PentaScanner at the patch panel end of the cable and the Microtest Super Injector at the modular jack end of the cable. Standards used shall be ATM 155 Mbps. Tests to be conducted shall be (but shall not be limited to):

1. Wire Map: Must be 12345678 straight through on near and far ends with no intermittent disruptions with wiring to code for EIA/TIA configuration T568B at both patch panel and modular jack ends of each cable.

2. Length: Must be in feet between 10 and 292 for each wire pair (i.e., four tests for a four-pair cable).

3. Impedance: Must be in ohms between 80 and 125 measured independently for each wire pair (see above).

4. Resistance: Must be in ohms between 0 and 18.8 for each wire pair.

5. Capacitance: Must be in pF picofarads between 50 and 5600 for each wire pair.

6. Attenuation: Must be in dB Decibels at a measured frequency in MHz listed at a limit in dB as follows:

2.4 dB at 1 Mhz	10.0 dB at 20 Mhz
4.7 dB at 4 Mhz	11.3 dB at 25 Mhz
6.3 dB at 8 Mhz	12.6 dB at 31.25 Mhz
7.0 dB at 10 Mhz	18.3 dB at 62.5 Mhz
9.0 dB at 16 Mhz	23.6 dB at 100 Mhz

7. Measurement of attenuation at 62.5 Mhz with a limit of 18.3 dB shall be used for printed report purposes.

8. Near-End Crosstalk (NEXT): Must be measured for each possible two pair combination, worst case measured in dB at the frequency which it occurred between 0.7 and 100 MHz (measured in linear 200 KHz steps), and each two pair combination must not exceed the NEXT limit as follows:

Pairs 12/36 > 28.1 dB	Pairs 12/45 > 27.1 dB
Pairs 12/78 > 27.8 dB	Pairs 36/45 > 27.1 dB
Pairs 36/78 > 27.1 dB	Pairs 45/78 > 27.6 dB

9. Attenuation to Crosstalk Ratio (ACR): Must be measured for each possible two pair combination (six combinations equals six tests) and must not be less than 5.0 dB on any pair combination.

J. Fibers tested and certified at 850 nm and 1300 nm wavelengths. Acceptable loss must be no more than .5 dB per connector and .1 dB per 100' at both wavelengths.

K. Testing completed from paragraph D.1.i. above must be completely documented with circuit identification number, all pass and fail reports (circuits with failures must be made to pass before they are acceptable and hence should have a minimum of two test reports), date of testing, cable manufacturer, tester serial number, software version (must be version 1.10a or other newer version superseding 1.10a), building, floor, closet, and all results from eight categories of testing. Each test shall be listed on a separate letter-sized sheet of white bond paper and shall also be available on 3-1/2" diskette in DOS format. **A cover letter signed by LAN installer/tester certifying complete compliance with Category Five or ATM/155 mbps standards as specified by the latest EIA/TIA specifications with a 3-1/2" diskette Microsoft Excel (Version 5.0 or newer) listing each test result is acceptable in lieu of letter size sheet of white paper.** Diskette(s) shall be able to be read and processed by readily available Microsoft Word (version 6.0 or newer) work processors or Microsoft Excel (Version 5.0 or newer). All written copies must be signed by LAN installer/tester certifying complete compliance with Category Five or ATM/155 mbps standards as specified by the latest EIA/TIA specifications.

L. All cables must be terminated using a compression connection tool. All cables shall be installed using Category Five standards as follows: Wire pair twists must be maintained to within 1/2" of contacts on each jack, jacketing must be undamaged for the full length of the cable run and must continue to within two inches of IDC contacts on each jack. All plastic cable ties must be trimmed with a flush-cut tool to ensure that no sharp edges result. Any cable(s) damaged during pulling shall be the responsibility of the pulling party/parties. Any cables failing tests (see above) shall be re-terminated, re-routed, re-tested, etc., until no other alternatives exist, at which time it will be assumed that a bad cable run (too much twisting of the cable, compression of jacketing and wire pairs, etc.) has resulted (at the discretion of the LAN Tester) and the pulling party/parties shall have to bear the responsibility of repulling new cable to replace it.

END OF SECTION

DIVISION 16

SECTION 16745 – KLAXON AND NAOC ALARM SYSTEMS

A. ALERT KLAXONS AND NAOC ALARMS

1. The klaxon is the primary alerting system. The normal klaxon pattern is a 30-second blast, followed by a 15-second pause, for three soundings.

2. Certain facilities on base require alert klaxon and National Airborne Operation Center (NAOC) alarm systems. Designers shall retain existing alarm systems whenever a structure is remodeled. Designers shall specifically ask for direction from the base project manager if alert klaxon and NAOC alarm systems are required for new facilities.

3. Alert klaxon alarms are located at several Fairchild facilities. (Refer to Fairchild Publication FAFBI 10-101, Table A4.1 for current locations.)

4. NAOC klaxon alarms are also located at several locations on Base. (Refer to 92ARW Operations Order 84-FY, Nightwatch Reception Plan (OPR XP) for current locations.)

B. KLAXON AND NAOC SYSTEMS

1. Both these systems are audio devices located to notify aircrews of the need to return to their aircraft. The audio alarms are located in specific buildings and some outdoor areas.

2. KLAXON SYSTEM: The Klaxon system is for Fairchild aircrews. The command post initiates the alarm by sending a 90 volt 20 Hz signal through the phone system to the location of the klaxon horn. The 90 volts activates a relay that controls 120 volt power to the klaxon horn.

3. NAOC SYSTEM: The NAOC system is for aircrews of special visiting aircraft. A crewmember of the visiting aircraft initiates the alarm from the aircraft via a phone line plugged into the aircraft. A switch is thrown in the plane that completes a 48 volt DC circuit from the command post. The circuit activates a relay (located at the Command Post). That relay sends a 90 volt 20 Hz signal over a phone line to a relay. The relay controls 120 volt power to a 120AC/12VDC transformer rectifier. The 12 Volt DC powers the NAOC horn. The NAOC horn is a yelping sounding horn different from the KLAXON horn.

C. EQUIPMENT TO BE USED INSIDE A BUILDING

1. KLAXON and NAOC RELAY: The relay used for both systems is a Type D relay Model KS 16301, List 15, manufactured by Wheelock Signals Inc., USA. The relay coil is rated 90 volts, 20 Hz. The contacts are rated 5 amp, 60 HZ 115 volt.

2. NAOC Horn: Yelping sound. 12 volt DC, Nutone model # S-2332. Alternate source is Moose Products Inc, Model # MPI-37, Hickory, North Carolina. This horn was last purchased through CARR Sales of Spokane Washington.

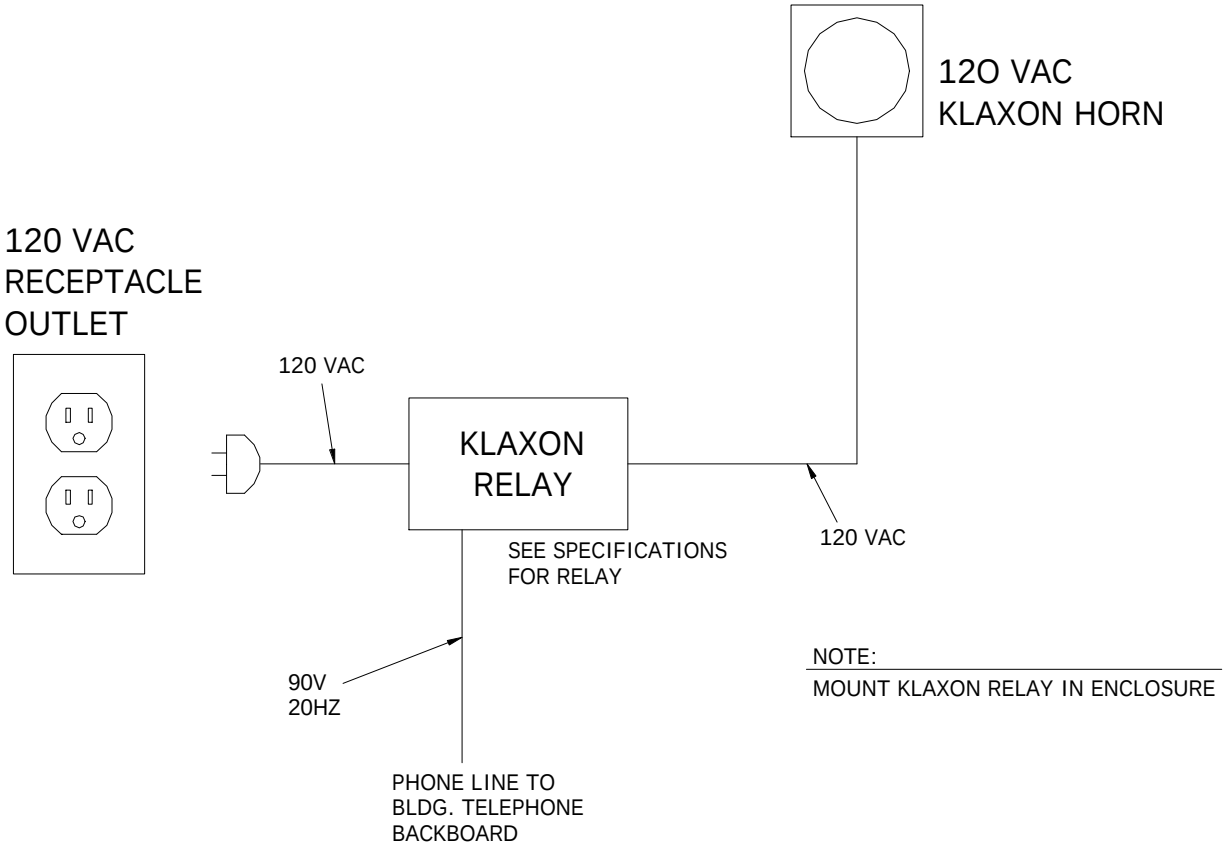
3. KLAXON Horn: Adaptahorn manufactured by Edwards (Unit of General Signal). Draws .13 amps. For indoor locations use part number 847-N5. Provide mounting box. For outdoor locations use part number 876-N5. For hazardous areas use part number 878-N5.

4. NAOC POWER SUPPLY: Magnetek Model WDU 12-1200. Input is 120VAC, 60 Hz, 24 watt. Output is 12 VDC, 1.2 amp, class 2 transformer.

D. WIRING DIAGRAMS:

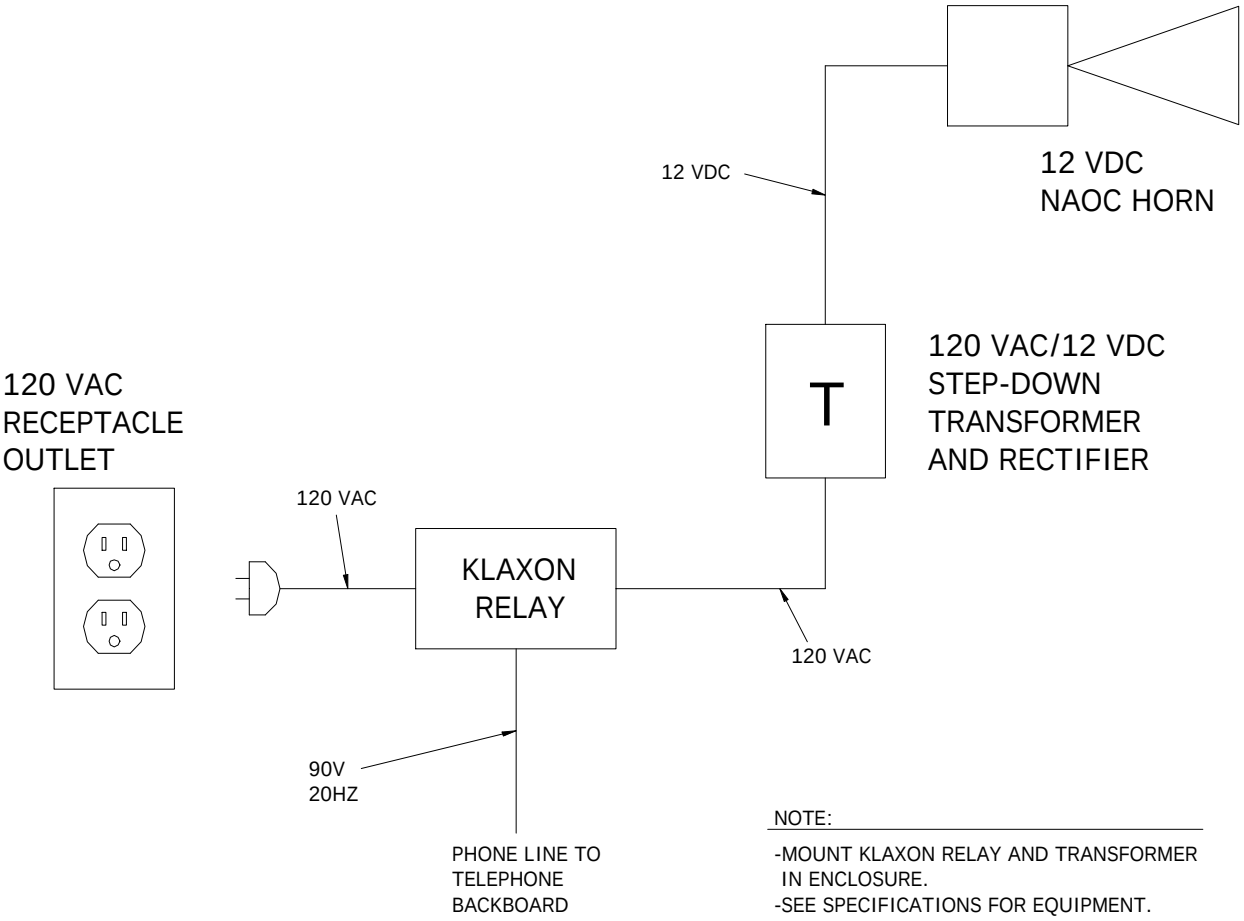
1. The following sketches show how the NAOC and KLAXON system components are wired together in the buildings.

END OF SECTION



1 KLAXON SYSTEM AT FACILITY

NOT TO SCALE



2 NAOC SYSTEM AT FACILITY

NOT TO SCALE